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A SYSTEMATIC TREATISE ON

Materia Medica

AND

Therapeutics

With Reference to the
MOST DIRECT ACTION OF DRUGS,

By

FINLEY ELLINGWOOD, M. D.,

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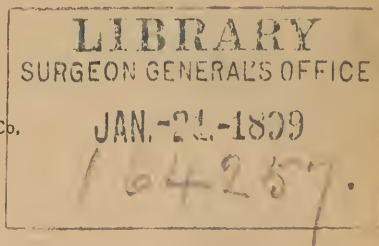
With a Condensed Consideration of
PHARMACY AND PHARMACOGNOSY.

By

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Author of "Etidorhpa."

Published by the Chicago Medical Press Co.,
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FINLEY ELLINGWOOD, M. D.
Chicago, Ill.

TO MY
WIFE AND DAUGHTERS
THIS BOOK
IS AFFECTIONATELY INSCRIBED
BY
THE AUTHOR.

PREFACE.

In presenting this work to students and physicians, the author desires to state that although it covers the field considered by other writers, it presents in addition the more recent observations of the action of drugs, many of which have never before appeared in book form, and the author's personal observations. There has been a need for a revision of our literature on this subject for several years past, and for the addition thereto of the results of the more recent observations and experiences. Up to the present time our literature has contained the results of the application of the principles of direct therapeutics originally enunciated, but there has been an evolution—a development, a progressive knowledge—of these principles, which was anticipated and desired by Scudder, King and others, which should be embodied in our permanent literature. These advancements it has been the aim of the author to present in this book, and also to show the consistency, the homogeneous character, the unity and individuality as a whole, of our principles concerning the influence of drugs, as applied in the investigations made, and here recorded.

It is possible that the confident expressions made in some cases concerning drug action may be received by many with incredulity, and it is possible also that the idea may have been expressed more strongly than the author intended, but to those who have had experience in prescribing the remedies here considered according to their specific symptomatology, after a careful, exact diagnosis of all the conditions of the disease for which prescribed, the confidence acquired by their successes will in most cases confirm the sanguine expressions of the author.

The author is under the greatest of obligations to Prof. John Uri Lloyd, of Cincinnati, not only for his most valuable contribution on the subject of Pharmacy and Pharmacognosy, but for the deep personal interest he has taken in the work, and for the

willingness with which he has given advice, and tendered most valuable suggestions and encouragement, and for the valuable monographs furnished by himself and by the firm of Lloyd Bros. The author also desires to express his obligations and sincere regard for the assistance and encouragement most generously given by Prof. Anson L. Clark, of Chicago, with whom the author has felt free to advise during the entire period of the formation of his plans for, and the publication of this work.

Recognition is due the firm of Parke, Davis & Co., of Detroit, for their generous contribution of a series of monographs, nearly sixty in number, upon the origin, history, botanical character, and therapeutic properties of new and valuable vegetable remedies, and the freedom they have granted in the use of the information there obtained.

The faithful character of those parts of this work, devoted to the Materia Medica of the Vegetable remedies, and to Electro-therapeutics, is almost entirely due to the faithful and careful study, untiring research, and persistent effort of Dr. A. W. Smith, of Chicago, late professor of Materia Medica in Bennett Medical College, who has labored constantly with the author during the entire year just past in the preparation of those parts of the work.

The strongest expressions of gratitude are due to all members of our school of physicians, with whom the author has consulted concerning the character and scope of this book, for the very generous confidence they have expressed in its ultimate character, and for the warm words of encouragement and assurances of support they have offered, the influence of which has been a source of much help in the many hours of discouragement and depression, which the character of a work of this kind naturally entails.

In the preparation of the material for this work, and in the collection of the facts, the author has drawn freely upon the entire literature of the Eclectic School, and in the capacity of editor of *The Chicago Medical Times*, has for many years preserved files, clippings and made memoranda of suggestions from the entire exchange list of the current medical literature of all schools. The following authors are among those who have been freely consulted: King's American, The United States, and the National Dispensatories, and Scudder, Locke, Watkins,

Webster, Ringer, Shoemaker, Hale, Hare, J. Henri Leonard, Wood, Bartholow, and Butler on Therapeutics, Gray's Manual of Botany, Bentham & Hooker's British Flora, J. N. & C. G. Lloyd, Drugs and Medicines of North America, Parke, Davis & Co., Pharmacology of the Newer Materia Medica, Johnson & Johnson, Monographs on Belladonna.

The medical journals most frequently quoted are The Eclectic Medical Journal, The Gleaner, The American Medical Journal, The Chicago Medical Times, The California Medical Journal, The Western Druggist, The Therapeutic Gazette, The Medical Record, The London Lancet, The Medical Age, The New York Medical Times, The American Journal of Pharmacy, The Pharmaceutical Journal, The National Druggist.

If the facts here presented should give a renewed impulse to investigation into direct drug action, and should in the least assist the physician in the prompt relief of human suffering, the efforts of the author will not have been unavailing.

FINLEY ELLINGWOOD.

Evanston, Illinois, December 25th, 1898.

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INTRODUCTION.

WITHIN the field of medicine, great advancement has been made in the past few years in the causation of disease, in pathology, and in the knowledge of disease action. Throughout the world the energy, thought and intelligence of the profession have been directed in these lines with most marvelous results.

In America great attention has been paid to therapeutics, with results that certainly *lead the world* in the application of remedies to the cure of disease.

With many students attention is paid in medical study to the more exact branches of the science. There is an uncertainty in therapeutic application which is distasteful to them. They become markedly proficient in surgery, in obstetrics, and in surgical gynæcology, in the study of histology, pathology and etiology, but they hesitate in applying their thought to an apparently uncertain branch of study. They have found in their study of the great writers, skepticism and doubt, amounting to disgust in many cases, for the study of therapeutics, and following in the footprints of their predecessors, many entertain the same doubt. But thought is advancing and the science of therapeutics is occupying a higher plane.

Nothnagel is quoted as having said that doctors know nothing about curing disease; all they can do is to sustain the patient and let nature cure herself. Physicians of today are learning to *cure disease* by *direct agents* in a highly satisfactory manner. In daily sharp competition with other successful practitioners each has absorbed every truth he could apply and has used it to the best advantage, constantly endeavoring to learn the most direct method of cure.

This independence, the sharp competition and acute foresight, have caused the best things from all the best doctors, and splendid things from quiet, unassuming doctors, and the good, successful measures of all schools, to become common property, until all doctors have access to all good things. Some of the wisest have caught many hints in the past from eminently irregular sources, which they have put into scientific form, and

have added them to the fund of general knowledge. All now look for the best things from all sources, hence the prevalence of our own methods.

There are gems of truth scattered throughout the methods of every individual practitioner, wherever taught or of whatever creed. These gems are rapidly becoming common property and all feel that they have claim upon them. Our method of drug application has become systematized and scientific; it has grown and become comprehensive until now all are studying in the line of the systematic science of *direct therapeutics*.

All are endeavoring to treat conditions in the directest manner; to study conditions well; to learn the directest action of each drug; to study positiveness without complexity and simplicity as far as consistent with correctness.

In a strict sense of the word, there are but few specifics to a given disease as comprehending all the symptoms included under one common head; but by dissecting each disease, by carefully analyzing it, by carefully studying its manifestations, we find prominent factors evidenced by well-known symptoms. Some of these are peculiar to the disease in hand, others are common to this and other diseases.

On the other hand, by a diligent study of our remedies, we find that each remedy has a special or general affinity for structures, parts or organs, and as we have used these agents and watched the special action of each one, we find that under given conditions the action of the agent upon the part or organ is constant, certain and reliable. To illustrate: Ergot produces contraction of the unstriated muscular fiber. It thus influences capillary contraction and relieves capillary congestion, especially of the central nervous system. There are many cases in which a loaded condition of the capillary circulation of the nerve centers is the actual pathological condition.

The long train of symptoms which appear when such a condition is present are flushed face, racking headache, restlessness, tremor, cold extremities, threatened cerebral hemorrhage and apoplexy, threatened convulsions, delirium. Why give several different remedies in complex and bad tasting formulæ for the symptoms named, when five drops of the fluid extract of ergot every hour will promptly and satisfactorily relieve the entire train of symptoms in a very few hours? Here is a direct

medication—a single remedy to a single condition, promptly relieving a long train of symptoms.

Those experienced in direct prescribing know well that sometimes a single condition may have so much prominence that treating it alone directly, will relieve all other symptoms, and understanding well the character and influence of our remedies, we may often accomplish this result with a single remedy.

While we believe always in treating the positive indications directly and immediately, and in selecting those for first treatment which seem to be basic—to underlie all minor indications, those upon which the others seem to depend—we do believe, most emphatically, in discovering the cause of the whole disorder, and removing it as quickly as possible. Then when the cause is removed the conditions it has induced are much more quickly relieved. Often no structural or fixed change in organs or tissues has yet taken place when the cause is discovered and removed, and if so all the symptoms cease and determine with the removal of the cause. Thus an intestinal antiseptic and an antiseptic flushing of the bowels given in the initial stage of typhoid, will often abort the disease within a few days by removing the germ of disease which underlies all the mischief. If progress is made before the germ is destroyed and ulceration has advanced, and blood changes and nervous disorders have occurred, then the prominent symptoms must be combated by the directed agents, in addition to the destruction of the germ of the disease. Curettage or antiseptic flushing of the uterus will cause the high temperature of puerperal fever to suddenly drop, and will suddenly end the whole train of symptoms sometimes in the early stage of the fever.

Advance in therapeutic knowledge is most rapidly made by the acquirement of a knowledge of the most direct manner in which these results can be accomplished—a knowledge of the action of those agents which most directly influence the organ and which will act in the most invariable manner upon that organ.

For the perfect adjustment of a reliable agent to the cure of specific disease, perfect knowledge of the processes and character of all the phases of disease are essential. The phases of the disease, the exact constituents of the total disease process, constitute the direct indications for treatment. The study of the

remedies must be made with strict reference to their adaptation to these phases, with the thought of making an apt adjustment between these constituents of the total process, either singly or collectively, and the indicated remedy. This thought the author of this work has endeavored to keep in mind.

In the classification of the remedies, in a work of this kind, different authors have each adopted a method in harmony with his own presentation of the subject as a whole. Many, like this author, desire the classification to assist the student in the comprehension of the therapeutic action of the individual remedies. Others arrange the agents in simple alphabetical order. It is impossible to make a perfectly exact and scientific arrangement even in the present advanced state of our knowledge, as nearly all agents influence more than one condition, and act in more than one manner under altered circumstances. Many methods of classification have been made, and writers retain their individual right to adapt the classification to their own method of presentation.

To facilitate systematic study the author has arranged all agents in a few great classes or groups. Within these groups the specific action of the agents is stated as determined by our own teachers, and the class to which the best writers assign it is fully stated.

The order of the study of the action of each agent will be found to be, first, the action of the agent in its own specific class and in the group in which it is arranged, and second, its action in each of the other general classes, beginning with the first in the order given.

Thus if an agent is being considered which acts upon the reproductive organs, its influence there is first to be considered, then any influence it may have upon the nervous system, then upon the heart and circulation, then upon the respiratory organs, then the stomach and so on, always in the order in which the groups are presented.

A careful study of the *specific symptomatology* of each drug will enable the student or prescriber to determine the most exact line in which the agent must be adopted. And a *strict adherence* to these suggestions will enable him to obtain *exact results*. He will surely fail, however, if he is not a *close observer of disease processes*; if he cannot analyze the total disease with

exactness; if he is not a good diagnostician. If he fails from these causes he must not charge the failure to the drug.

In the course of our study we have endeavored to acquire so perfect a knowledge of drugs that we may be enabled to meet a single indication, whether that indication is simple or composite, with *a single drug*. We are yet a long way from a perfect knowledge of such adaptations, but our knowledge is constantly widening, and our confidence in the action of organic remedies is increasing so rapidly that we feel assured that close study will soon enable our followers to place therapeutics upon the basis of an exact science. Our marvelous successes, our rapid advancement in recent times, and the confidence established in our entire branch of the profession by the invariable action of our remedies, increase our assurance of such an ultimate outcome. It would be of great advantage to the student if we had the space here in which to introduce suggestions for the analysis of disease—for the study of specific diagnosis, for the consideration of the tongue, pulse, temperature and other general and specific evidences, and direct to each indication its selective drug, but this must be reserved for other authors or for a future work of this author. We have only room here for the consideration of the agents themselves. It has been found necessary to treat briefly of certain pathological processes in order that we may show the more perfectly the adaptation of classes of drugs, and the importance of certain lines of treatment, or to give clearly the reasons for the establishment of certain principles of practice.

Eclecticism was originally composed of many dissonant facts. These have been fused or amalgamated until it now has an essentially exact constitution, a homogeneous consistency, a characteristic individuality, which wins for it the approval of all consistent observers. In this work an effort is made to show this homogeneity, to exhibit the characteristic traits of our method with distinctness, to preserve the integrity of our fabric, and to impress others not previously observant with the essential cardinal truths herein developed.

DEFINITION.

Materia Medica is the consideration of drugs, their origin and methods of preparation, their chemical construction and constituents, general physical characteristics, preparations used in medicines, dosage and general influence upon the animal economy.

Therapeutics is the intelligent application of agents and methods to the cure or alleviation of disease.

Specific Therapeutics is a term adopted to specify the adaptation of each remedy in the most direct manner, in accordance with its selective action upon any organ or part, for the restoration of that organ or part to health.

Pharmacy or Pharmacognosy is the science of drugs, and the science and art of the preparation and dispensing of the remedies which are to be administered by the physician for the cure of disease.

Note—It has been found by investigating the action of drugs, by a close study of their influence upon the animal body, that no one remedy influences the entire organism in a regular, certain and direct manner in disease consistent with the normal action of each organ or part; but that each one, in accordance with some inherent law not well understood, influences in a definite manner some organ or part, and that this influence can be directed and controlled by the intelligent prescriber for the accomplishment of one of several important results. First; it directly destroys or removes the cause of disease, and where perversion of the function is not permanent, or where structural change has not taken place to too great an extent, it permits the organ or part to act in accordance with inherent natural tendencies, in the performance of its normal functional operations. Second; it may remove or cause the removal of obstructions to the performance of the health function of an organ. It may cause the absorption of plastic deposits or other results of inflammatory action. Third; it may increase the *inherent power* of the organ to throw off the influences of disease action, and to reassume the normal function of health. Fourth; it may cause some other function or organ of the body to exercise a direct influence upon the disease processes at work upon that organ in such a manner as to stay those processes and permit the normal conditions of the organ to reassert themselves. Fifth; it may supply deficient chemical constituents — essential constructive material — protoplasmic pabulum directly to the part, and thus enable it to assume its normal condition.

PHARMACY AND PHARMACOGNOSY.

JOHN URI LLOYD, Ph. M., Ph. D.

In accepting the responsibility of this section of this work I appreciate fully that I am invited to contribute my mite because of the fact that my life has been devoted to the study of pharmacy. Naturally this fact should give a discriminative value to the work of any attentive man, and I will preface my remarks by saying that in my case lengthened experience has led me to hesitate to express myself concerning many problems in pharmacy that, at one time, would have presented no cause for hesitation. To speak plainly, expanding views and thoughtful work in pharmacy have both widened the horizon and illuminated the space about until I now see defects in work and error in judgment that were formerly unperceived. I believe that this condition must be true of all men who approach the end of a life that has been devoted to this calling. Only those who do not comprehend the subject can view it otherwise than as a mighty work, beyond the power of any man to grasp in its entirety, and only those who by reason of ignorance are led to underrate this great art will presume to encroach on the field other than as questioners and as listeners.

With these candidly expressed views, I shall proceed to speak to my physician friends in the utmost freedom concerning the subject before me, assuming that they comprehend that pharmacy is not a subject any man can hope to master by book study alone. I shall therefore endeavor to convey in as condensed a way as possible a brief description of the prominent classes of pharmaceutical preparations, and their relationships, confining myself practically to medicinal preparations made of plants.

In arranging these classes I shall not follow the alphabetical method, but shall group similar classes together, and thus refer to their relationships. For example, plant preparations will be found in natural sequence, the entire lot embracing extracts, solid and fluid, tinctures, etc., etc. In like manner, liniments, ointments, cerates and plasters are grouped, and so are gelatine and sugar-coated pills, tablets and troches. Naturally, a few classes, like emulsions and suppositories, are outside of any system of classification.

Crude Drugs—The greatest care must be used by the pharmacist in the direction of drug selection. The crude drug is the foundation of the pharmaceutical preparation. Poor crude

material is productive of inferior medicine, regardless of the care of the operator. The study of applied pharmacy consequently begins with a study of drugs, and carelessness or ignorance concerning this oft neglected section in pharmacy is to be held accountable for much poor medicine—more, indeed, than is generally known.

The qualified pharmaceutist must not only be conversant with manipulative methods, but also experienced in pharmacognosy, or the study of drugs. In this direction it is not alone sufficient to be able to distinguish between different drugs (this is useful to guard against sophistication), but he must be able to judge of the intrinsic qualities of drugs. This last is the most important part of the art of pharmacognosy, for while it is easy to learn to identify different drugs it is difficult to obtain the experience necessary to judge of quality shades.

Thus, as an example, a pharmaceutical student can easily qualify himself so as to be able to distinguish between the appearances of Vanilla and Tonga beans, and even to close his eyes and identify each by the odor alone, but much experience is necessary for him to be able to differentiate between shades of quality in Tonga and in Vanilla. The same is true of other drugs. There are many different qualities of drugs of every description, and, in my opinion, the knowledge necessary to their successful differentiation is only to be gained by patient study and great experience in practical pharmacy.

True it is that in some instances chemical tests may be employed for drug valuations, but these cases (for example, Cinchona and Opium) are so few as to scarcely bear any comparison with the great number in which we have absolutely no recorded method of detecting values. Hence it is that the educations of many conscientious pharmacists are necessarily deficient in this direction by reason of the fact that in many cases they are situated where there is so little demand for pharmaceutical preparations as to limit their opportunity to qualify themselves. Indeed, in my opinion, this much to be deplored lack of facility to become personally expert, rather than intentional disregard of duty, accounts for much defective medicine in the line of plant preparations.

But that ignorance of manipulative methods in connection with inexperience in pharmacognosy may be productive of great harm, is evident to all thoughtful pharmacists, and those best versed in the art understand best the responsibility resting on the man who audaciously ventures to step into this field without the knowledge that comes from long drilling in practical work under the watchful care of an experienced instructor.

And in this direction I cannot but criticise the opinion some very close friends hold concerning the pharmacist's calling. Neither books nor lectures can teach pharmacy in its broadest

sense. The foundation that is gained by the fortunate possessor of a systematic college of pharmacy education, is not to be undervalued, but it is only a foundation for the recipient to build upon in the future. In my opinion, no man should at this day be permitted to engage in pharmacy manipulation without a preliminary college course of instruction in pharmacy, neither should he be allowed to practice pharmacy by reason of college instruction alone.

The study of crude drugs in my opinion is most important. Not only does the quality of the resultant pharmaceutical preparation depend on great care concerning the quality of the drug, but ignorant persons posing as pharmacists, are likely to even use substitutes thrown on the market for the genuine. The man who underrates the importance of experience, study and care in this direction, is the man who knows little about the true study of pharmacy. This thought leads to a consideration of the section of pharmacy which embraces drug study, structure, etc. known as

Pharmacognosy—In all colleges of pharmacy, in all institutions where men devote their lives to teaching pharmacy, this section of the art comes first, and is considered the most difficult to master (if, indeed, it is ever mastered). And, strangely enough, it may be said that by inexperienced persons, novices, this very section is neglected or is passed as unimportant. Pharmacognosy, in the ordinary sense of the word, is that part of pharmacy devoted to the consideration of the physical and structural qualities of drugs, but when applied to plants, I must carry the conception higher and further than microscopic examination of tissues or the simple identification of drugs. And while much that is embraced in this section of pharmacy may be learned by lecture lessons and in book study, a great and important part of the study of pharmacognosy cannot be obtained other than by close attention in practical pharmacy manipulation.

Taste, odor, condition, all that experience in qualities adds to knowledge through our senses, is a part of the work of the pharmacognosist. It is not enough that by means of the microscope the fact be demonstrated that the drug is true to name, the qualified pharmacist must be able to establish whether that drug is suitable to make a reliable preparation. It may be correctly named and yet worthless.

For example, the microscope may enable the operator to assert positively that a certain bark is Wild Cherry bark, but the man who decides whether the same specimen of bark is fitted to make a reliable fluid extract of wild cherry must go beyond the simple fact of its identity. This latter point can only be established in cases of certain drugs by a complete knowledge of chemical methods, with others by the experience that comes

with years, yes, a lifetime of scientific work in drugs, and in other cases still by the expertness of experience in which no words and no diagrams are able to convey the knowledge gained by the student, but which knowledge typical of empiricism is outside scientific formulæ. To sum up, the true pharmacist must be a faithful pharmacognosist, and must have not only the knowledge that comes from books and instructors, from college courses with their object lessons, but, in addition to all these, must devote years, even a lifetime, patiently to every phase of the subject in its practical application.

Qualities of Drugs—From what has been said it will be perceived that I can only touch in a general way on this mighty subject. When it is considered that volumes have been written in many languages, by men who have devoted series of years to the subject of structural pharmacognosy alone, it will be seen that I can in this space simply make an abridged statement of facts.

The quality of drugs is all important, but no general rule can be established to determine quality, neither can any man be taught this section of pharmacy by printed lessons. The application of chemical tests is useful in a few instances—a very few—chief among which may be cited Opium, Cinchona, Belladonna, Ipecac, and a few other alkaloidal drugs. Then, Asa-fetida, Jalap and a few resinous drugs may be approximately valued by their resinous constituents.

Extend the list to a limited number of glucoside yielding drugs and a few essential oil bearers, and the list capable of chemical determination is about exhausted. Structure, as shown by the microscope, determines authenticity of name, not quality, as already explained. The quality of drugs must be determined through the personality of the pharmacist, the acuteness and perception of his senses, the experience gained in his labors, the drilling he receives from his methods and the self-instruction that comes from a love of his art. But even these are not enough, in many cases, for attention must be devoted to a study of climatic conditions, the influences which localities sometimes exert on drug values, the season of the year in which the drug is gathered and the time that elapses before the drug is manipulated after it is gathered. In this direction little information is to be found in print.

My experience teaches me that some drugs must be worked green, others partly dry, and that others are best when thoroughly dried, while others yet even become most useful after being aged to a certain extent. Thus, as examples, only green cactus, in my opinion, is of value, freshly dried *Iris versicolor* is superior to the green, and *Croton tiglium* improves by age. In some cases, preparations of the green and the same plant, before and after drying, have distinctly different qualities, as

with tobacco. These differences in condition conversant on environment, age, season, species, it is the duty of the pharmacist to master so far as opportunity permits, and it is the duty of physicians to uphold the conscientious pharmacist who devotes his care in this direction.

In no sense of thoughtless criticism do I say that the indifference of some members of the medical profession to the magnitude and importance of the subject of pharmacology has been to me a source of pain, knowing as I do the importance to the medical profession of this feature of our art. He who claims to be a pharmacist and yet slights the subject of quality of drugs does no credit to pharmacy, and the physician who belittles this great study is surely ignorant of its intricacies and magnitude.

Crude Drugs as Remedies—The difficulty of administering crude drugs is too well understood to require comment. Naturally the first step in an attempt to facilitate their employment is that of comminution, or powdering them. The use of powdered drugs in substance, however, with a few exceptions, presents scarcely any advantages over the use of crude drugs. At the best, powdered drugs, with their great burdens of inert matters, are impractical remedies. This fact necessitated the application of manipulative methods, the object being to exclude the objectionable parts of the crude drug and to obtain forms of medicaments capable either of representing in small compass large bulks of crude drugs, or of presenting the active parts in more elegant form.

The first step in this direction, naturally, was the extracting of drugs with hot water, *infusions* and *decoctions* being the result. But these preparations were subject to grave objections. In the first place, water is capable of abstracting but a limited part of the constituents of many active drugs, such as fixed oils and resins. Second, it dissolves most of the gums, mucilages, inert and objectionable constituents of plants, thus making bulky, disagreeable, often very weak remedies. In the third place, it forms solutions that ferment readily, becoming unreliable in a very few hours. There are other objections to *infusions* and *decoctions*, such as the fact that volatile constituents are lost by boiling, but these considerations need not now be mentioned.

As a sequence, the employment of alcoholic menstrua soon crept into use, thus making the class known as tinctures, and, at a very early day, the separation of volatile constituents by boiling drugs with water and condensing the steam, also produced a class of medicated waters. Owing to the unpleasant taste of decoctions and infusions sugar was finally added to them, and thus the class of *syrups* arose.

But these preparations are, as a rule, of little strength, or else of uncertain quality, the average dose necessarily being great, even with energetic drugs. From a tablespoonful to

a tumbler often was not unusual with those destitute of toxicity.

About the beginning of this century, the necessity of more concentrated preparations became apparent; naturally the evaporation of tinctures, decoctions and infusions resulted. The products were usually reduced to the consistence of a stiff magma capable of being rolled into pills with or without the addition of an excipient, and to these substances the term *extract* was applied. When alcoholic tinctures were used, the term *alcoholic extract* was affixed, while decoctions and infusions gave *aqueous extracts*, and mixtures of alcohol and water gave *hydro-alcoholic extracts*. When these extracts were dried and powdered, they produced the class known as *powdered solid extracts*.

But it became apparent to thoughtful persons that extracts often did not, as might naturally be supposed, represent the tincture employed, and then it was discovered that heat and atmospheric influence affected the remedial part of the remedy deleteriously, indeed even in some cases to its utter destruction. About this time percolation was introduced into pharmacy and with this process of extraction came efforts to concentrate liquid representatives of drugs without evaporation, and to these products the terms *concentrated tinctures*, *saturated tinctures* and *fluid extracts* were affixed. These preparations were all made with alcoholic menstrua, and thus either of the foregoing names could be rationally applied to this one class. With their advent came manufacturing pharmacists, who preferred the term that struck their several fancies, indeed in some cases the manufacturer even used all of them, as in right he could do. But gradually the terms *concentrated tinctures* and *essential tinctures* gave way to the term *fluid extract*, which becoming the official title in the pharmacopœia, has now practically displaced the others. Thus may be seen the records and relationships of these classes of pharmaceutical preparations and, also, briefly traced, the record that beginning with crude drugs led up to their several existences.

Inasmuch as *Galen* first prominently introduced plants into medicine, or at least, because he has been given great credit in this direction, *plant preparations* are often known as *galenical preparations* or *galenicals*, under which term we may include all of them. Having introduced plant preparations in a general way let us now give as much special attention to the members of these classes as our space will permit.

Infusions — These preparations are made of coarsely ground or bruised roots, barks, herbs and seeds. They are, as a rule, prepared by pouring boiling water over the drug, stirring the mixture occasionally, and finally straining it. Sometimes special directions are employed as in the official infusion

of Cinchona, in which cold water, aromatic sulphuric acid and percolation are used; or infusion of wild cherry, in which cold water and percolation are employed. However, the exceptions are limited. The following general directions of the Pharmacopœia may be applied to the preparation of infusions generally.

Infusions—An ordinary infusion, the strength of which is not directed by the physician or specified by the Pharmacopœia, shall be prepared by the following formula:—

“Take of

The substance, coarsely comminuted, <i>fifty grammes</i> ,	50 Gm.
Boiling water, one thousand cubic centimeters, -	1,000 Cc.
Water, a sufficient quantity to make one thousand	
cubic centimeters, - - - - -	1,000 Cc.

Put the substance into a suitable vessel provided with a cover, pour upon it the boiling water, cover the vessel tightly, and let it stand for half an hour. Then strain and pass enough water through the strainer to make the infusion measure *one thousand (1,000) cubic centimeters*.

CAUTION—The strength of infusions of energetic or powerful substances should be specially prescribed by the physician.”
—U. S. P.

Bear in mind that infusions are prone to ferment, and must be constantly replaced by fresh ones. Still, in my opinion, infusions of some fresh plants that contain delicate constituents are to be preferred to any preparation made from the dry plant, and in cases where the medicinal constituent is a gum or mucilage, insoluble in alcohol, the infusion is preferable to any alcoholic preparation.

Decoctions—As a rule decoctions are made by pouring cold water over a coarsely ground or bruised drug, the mixture being boiled for fifteen minutes, cooled and strained. Very few exceptions are recorded to this rule, the Pharmacopœia making but two, viz.: *Decoction of Cetraria* and *Compound decoction of Sarsaparilla*. The following general formula of the Pharmacopœia of the United States may be applied wherever a decoction is desired.

Decoctions—An ordinary decoction, the strength of which is not directed by the physicians, nor specified by the Pharmacopœia, shall be prepared by the following formula:

“Take of

The substance, coarsely comminuted, <i>fifty grammes</i> ,	- 50 Gm.
Water, a sufficient quantity,	

To make <i>one thousand cubic centimeters</i> ,	- 1000 Cc.
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Put the substance into a suitable vessel provided with a cover, pour upon it *one thousand (1,000) cubic centimeters* of Cold Water, cover it well, and boil fifteen minutes. Then let

it cool to about 40 deg. C. (104 deg. F.), express, strain the expressed liquid, and pass enough Cold Water through the strainer to make the product measure *one thousand* (1,000) *cubic centimeters*.

CAUTION—The strength of Decoctions of energetic or powerful substances should be specially prescribed by the physician.”
—U. S. P.

Like the infusion, decoctions ferment quickly and must be made often. It must be remembered that while the usual strength of both decoctions and infusions is one part of drug to twenty of the finished preparation, the proportion of all energetic (poisonous) drugs must be established by the prescribing physician, who has also the privilege of increasing or decreasing the proportion of all others. At the best, however, both infusions and decoctions are deficient in drug valuation or reliability. If the aim of the physician be to administer much hot *water* and little drug, or large doses of liquids of uncertain strength, they are well fitted to their purpose. Such are the natures of teas, which in reality, as catnip, pennyroyal, etc., etc., are infusions and decoctions in which it is immaterial as to whether or not the drug proportions be uniform.

Syrups—As has been said, syrups were originally infusions or decoctions thickened with sugar. Such syrups were common in early eclectic medication, and when derived from several drugs, mixed together, were called Compound Syrups. But about thirty years ago the fact began to be seen that the sugar not only diluted the liquid but weighted the remedy with useless extraneous material, often disturbing the stomach of the afflicted person. Then it was that many far-sighted eclectics made a crusade against the *syrup craze*, and as a result practically swept these cumbersome substances out of use in our school. While it is true that many syrups made by expert pharmacists are improvements over decoctions and infusions in elegance, the fact remains that as a rule, sugar is worse than useless in medicinal preparations, and is to be viewed as an impurity. Few sick persons relish sweet.

In a very few cases where sugar is a preservative, a syrup is, however, preferable to any other form of the remedy, and among these may be named *Syrup of Iodide of Iron*, in which sugar is useful as a preventor of chemical change. No general formula can be given for making syrups, but individual directions may be obtained from the Dispensatories and the Pharmacopœia. Syrups are nearly out of use in eclecticism, but as an example of the method of making one of the old eclectic syrups I append the following from King's Dispensatory:

Syrupus Mitchellæ Compositus. *Compound Syrup of Partridgeberry*. (Zusammengesetzter Mitchellen. Beeren Syrup.)

Preparation—Take of Partridgeberry, *one pound*; Helonias root, High Cranberry Bark, Blue-Cohosh root, each *four ounces*, all in fine powder. Grind and mix the articles together; place the whole pound and three-quarters in a convenient vessel, cover them with fourth proof Brandy, and macerate for three days. Then transfer the whole to a displacement apparatus and gradually add Brandy until three pints of spirituous tincture have been obtained, which reserve. Then continue the displacement with Water until the liquid passes tasteless; add to this *two pounds* of refined Sugar, and evaporate by a gentle heat to *five pints*; remove from the fire, add the reserved *three pints* of Spirituous Tincture and flavor with Essence of Sassafras. Strictly speaking, this is not a syrup, but sweetened Infusion, yet I place it here as being nearly in its appropriate class. It is often termed *Mother's Cordial*, but is superior to the article to which this name was formerly applied.—King's Am. Dispensatory.

Tinctures—This class of preparations derived its name from the fact that they were usually of a dark color, or, at least, possessed of a characteristic color. They are made of alcoholic menstruums and as a rule are of deficient strength as compared with extracts and fluid extracts. Formerly tinctures derived from single drugs, if unofficial, were by common consent made to practically represent two ounces of drug to the pint. At present the custom seems to warrant the proportion of one part of drug to ten parts of finished tincture. The Pharmacopœia and Dispensatories give special direction for making each tincture named therein, and yet most of them are prepared by one general method, of which the following is typical:

"Tincture of Hyoscyamus:—

Hyoscyamus, in No. 60 powder, <i>one hundred and</i>	
<i>fifty grammes,</i>	150 Gm.
Diluted Alcohol, <i>a sufficient quantity,</i> to make one	
thousand cubic centimeters,	1,000 Cc.

Moisten the powder with *one hundred and fifty (150) cubic centimeters* of Diluted Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Diluted Alcohol upon it, until *one thousand (1,000) cubic centimeters* of tincture are obtained."—U. S. P.

Tinctures carry all the substances soluble in the menstruum used to exhaust the drug, both inert and active, and are prone to precipitate. Excepting with energetic drugs, a large amount of alcohol must be administered in order to get the full therapeutic drug effect. Tinctures (with a few exceptions) are rapidly falling into disuse and are practically discarded in eclecticism, where very concentrated, exact preparations of plants are now generally employed.

Fluid Extracts—These, as has been shown, are in reality

concentrated tinctures, and had the Pharmacopœia selected that term it would have been as appropriate to the class as the term fluid extract. They are made by percolation, and carry all the constituents, good and bad, found in tinctures. Consequently, while they are to be preferred to tinctures, as a rule, because of their greater drug strength, they are burdened with inert materials and valueless drug constituents. The proportion of active constituents to those useless is surprisingly small in all fluid extracts. In my opinion, this burden of inert extractive matter constitutes one of the great objections to fluid extracts. As is well known by eclectic physicians, this feature of the subject has been a special study with me for many years, and papers from my pen a quarter of a century ago criticised them because of this imperfection. I foresaw that unless this undesirable quality could be overcome they would not maintain their position, and I have no reason to question but that the ground was well taken.

Fluid extracts are with few exceptions made by percolation according to one general formula, the distinction being proportion and menstruum. Still it must not be inferred that carelessness or ignorance can be pardoned in one who attempts to prepare fluid extracts; upon the contrary, in my opinion, too much care and too great experience have as yet to become a precedent in this branch of pharmacy. The art of percolation, the nature of drugs, the valuation of product, the study of changes, is, each of them, capable of consuming a devoted life. And yet while the fluid extract at the best is imperfect, it is a useful remedy when fresh and conscientiously made, although thoughtful, experienced pharmacists perceive fully their imperfections, to which I will briefly allude.

They are prone to precipitate; they are usually thick with inert matters, both colored and colorless. They are of variable strength, owing both to variation in the quality of crude drugs and the care of the manufacturer.

I have said that these preparations must be carefully made, and I shall not hesitate to express myself in plain language on this point. Physicians should not accept that a novice in pharmacy can successfully make these remedies. This view will be upheld by all manufacturers of pharmaceutical preparations and by all experienced pharmacists, and will be attacked only by persons destitute of practical experience sufficient to give a fair knowledge of the subject.

Fluid extracts are intended by the Pharmacopœial committee to represent practically one grain of drug to one minim of the finished preparation. The present revision of that book makes it one gramme to one cubic centimeter. Still this comes so close to the foregoing as to be unimportant when the variation of the drug is concerned, not to speak of the difference in manipulation by different pharmacists.

I shall close the subject by saying that the following formulae, one from the United States Pharmacopœia, and the other from King's Dispensatory, are typical of the usual process for making fluid extracts, but that unless a person has been well drilled in pharmacy it is worse than folly for him to attempt to follow either of them:

“*Fluid Extract of Podophyllum*:—

Podophyllum, in No. 60 powder, *one thousand*
grammes, - - - - - 1,000 Gm.

Alcohol,

Water, each, *a sufficient quantity*

To make *one thousand cubic centimeters*, - 1,000 Cc.

Mix *eight hundred (800) cubic centimeters* of Alcohol with *two hundred (200) cubic centimeters* of Water, and, having moistened the powder, with *three hundred (300) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Podophyllum is exhausted. Reserve the first *eight hundred and fifty (850) centimeters* of the percolate. Distil off the Alcohol from the remainder by means of a water-bath, and evaporate the residue to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand (1,000) cubic centimeters*.”

—U. S. P.

“*Fluid Extract of Polymnia*:—

Synonyms—Fluid extract of *Uvedalia*; Fluid extract of bear's-foot.

Preparation—Take of the root of *Polymnia Uvedalia*, in moderately fine powder, 16 troy ounces; Alcohol, a sufficient quantity. Moisten the powder with 6 fluid ounces of Alcohol. Cork tightly in a wide mouth bottle, and permit the mixture to stand an hour in a warm situation. Then introduce it into a cylindrical percolator, three inches in diameter, previously prepared for percolation, according to directions given on page 756, and press very firmly. Cover the surface of the powder with a circular piece of filtering paper, held in position with a few fragments of glass or marble, and add alcohol until the percolate appears at the exit. Then cork the exit tightly, cover the percolator and place it in a warm situation.

After twenty-four hours, loosen the cork and permit the percolate to pass as fast as it will drop, without running in a stream, until four fluid ounces are obtained. Again close the exit, macerate twenty-four hours, and in a manner like unto the preceding draw four fluid ounces of percolate. Repeat the

maceration, and in like manner draw a third portion of four fluid ounces. Reserve and mix the three percolates; then continue the percolation until eight fluid ounces are obtained. Evaporate this latter portion until reduced to the measure of two fluid ounces, and mix with the reserved twelve fluid ounces. The surface of the powder must be constantly covered with alcohol from the commencement and until the end of the process of percolation."—King's American Dispensatory.

Extracts (Solid Extracts)—When a fluid extract is evaporated until the residue reaches a masslike consistence, a prime solid extract results. Such fluid extracts, however, as contain glycerin cannot be reduced to this consistence. Solid extracts, therefore, do not contain any therapeutic qualities in addition to those possessed by the tincture, and as has been already said may be much injured by heat and atmospheric influence during evaporation.

For some purposes, however, as in making pills, ointments and plasters, where liquids cannot be employed, these preparations answer a good purpose, although the physician should administer liquid plant remedies if he desires to obtain the full effect of the drug. The bulk of each solid extract is composed of inert extractive matters, such as gum, glucose, earthy salts, coloring matters, chlorophyl and other bodies possessed of little if any medicinal value. This is especially the case with aqueous extracts, and hydro-alcoholic extracts, some of which are nearly valueless.

At the best, commercial solid extracts are less reliable than either tinctures or fluid extracts, although when care and skill are employed in their preparation active drugs may yield very energetic remedies. Among the most creditable and definite solid extracts is to be found the official solid extract of physostigma, formula for which is herein introduced:

"Extract of Physostigma:—

Physostigma, in No. 80 powder, *one thousand grammes, 1000 Gm.*
Alcohol, *a sufficient quantity.*

Moisten the powder with *four hundred (400) cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until *three thousand (3,000) cubic centimeters* of tincture are obtained, or the Physostigma is exhausted. Reserve the first *nine hundred (900) cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50 deg. C. (122 deg. F.) to *one hundred (100) cubic centimeters*; mix this with the reserved portion, and evaporate, at or below the before-mentioned temperature, in a water-bath, to a pilular consistence."—U. S. P.

The Pharmacopœia and Dispensatories give special directions for making a large list of solid extracts, but these are only of general interest to physicians.

Solid extracts that are used in making pills, ointments and plasters seem to hold their own in commerce, but for internal administration (excepting, perhaps, with a few energetic drugs) they are fast being discarded.

Powdered Solid Extracts are even less reliable than mass extracts. They seem, as a rule, excepting such as contain fixed therapeutical constituents, to possess little reliability. The final act of drying an extract is exceptionally disastrous. Much harm to pharmacy and to medicine has been done, in my opinion, by thoughtlessly accepting that the drug values of tinctures and fluid preparations can be carried into a dry condition, either as extract or otherwise. Among the most creditable powdered solid extracts is that of opium when made by the official process, which, like the method of making all good pharmaceutical preparations, cannot be followed by incompetent persons. This formula may be cited as a specimen of this class as follows:

"Extract of Opium:—

Powdered Opium, *one hundred grammes*, - - - 100 Gm.
 Sugar of Milk, recently dried and in fine powder,
 Water, each, *a sufficient quantity*.

Triturate the Powdered Opium in a mortar thoroughly with *one thousand (1,000) cubic centimeters* of Water, repeat the trituration occasionally, in the course of twelve hours, then filter through a rapidly-acting, double filter, and wash the filter and residue with Water until the filtrate is nearly colorless. Concentrate the filtrate and washings in a tared capsule, on a water bath, until the residue weighs about *two hundred (200) grammes*, and allow it to become cold.

Determine the weight exactly, transfer *twelve grammes* of it to an Erlemeyer flask having a capacity of about *one hundred (100) cubic centimeters*, and determine in this portion the amount of morphine by the process of assay given below, using the quantities of liquids there directed for *four (4) grammes* of the dry extract. In other portion of *five (5) grammes* determine the amount of water by drying it in a flat bottomed capsule, at 100 deg. C. (212 deg. F.) until it ceases to lose weight. From the results thus obtained ascertain, by calculation, the amount of morphine and of water contained in the remainder of the extract, add to this enough well-dried Sugar of Milk to bring the quantity of Morphine in the final dry extract to *eighteen (18) per cent.*, then evaporate the whole to dryness, reduce it to powder, and transfer it to small, well-stoppered vials."—U. S. P.

Medicated Wines are solutions of medicinal substances in in which wine is the menstruum. In a few cases, as with *Bitter*

Wine of Iron, both organic and inorganic substances are employed. In others, as with *Wine of Ferric Citrate*, an inorganic compound is dissolved in white wine. Others, as *Wine of Ipecac*, are made of a single plant, while others still, as *Wine of Opium*, are made of mixtures of plant products. The medicated wines are nearly obsolete, being, at best, seldom used in eclecticism.

Vinegars—These preparations are not very uniform, and are similar to tinctures, excepting that in making them either diluted acetic acid or vinegar is used as a menstruum instead of alcohol. The early eclectic physicians considered several medicinal vinegars with some degree of favor, for example, *Vinegar of Lobelia*, *Vinegar of Sanguinaria*, etc., and, even to this day, King's Expectorant, a compound Vinegar, is valued by many eclectics.

In continuing the subject to *unofficial* plant products, I shall conclude by making a few general remarks that must necessarily be brief. From time to time manufacturing pharmacists and apothecaries have introduced special preparations, either of single drugs or of mixtures of drugs. Out of these grew many compounds, now found in the foregoing classes, for a demand arising with physicians necessitates their recognition. In the early days of eclecticism a class of preparations was evolved concerning which I must say a word. These, known as the eclectic resinoids or concentrations, as a rule were made by private methods.

But at that early day the natures of drugs were very poorly understood. American pharmacy was an untrodden field, and it is not to be wondered that blunders and errors concerning some products crept into existence. Consequently, while many of the "resinoids" proved to be useful remedies, others were valueless. Gradually the enthusiastic parties concerned were led to appreciate the fact that it was impossible to carry the full, or even the partial, therapeutic values of many plants into a dry condition, and at last the majority of the class of resinoids was abandoned by its advocates. Still the labor of these most zealous men was not altogether lost, for a few of the so-called resinoids stand yet conspicuous as remedies and as definite chemicals, and are used the world over by all classes of physicians.

But the bright anticipations of Prof. King, Mr. Merrell and others concerned in the evolution of these preparations were shattered, and as a result much that had been hastily accepted concerning their qualities had to be relinquished. This fact is patent to whoever will take the pains to read the remarks of Prof. King on this subject in the *American Dispensatory*.

For a long period after these exasperating experiences, eclectic physicians contented themselves with the classes of

preparations already described, such as syrups, tinctures, fluid extracts, etc., many being of eclectic origin. But about this date they were prone to prescribe mixtures—compound syrups, compound powders, compound tinctures, compound extracts, etc., and, indeed, the tendency of eclectism was towards medication by means of complex mixtures.

Then came Prof. John M. Scudder, who united with several eclectic physicians and rebelled against polypharmacy medication. They asserted that physicians should study the action of single drugs, and if mixtures were to be prescribed, should, when possible, make the mixtures when prescribing for the patient. These authorities viewed commercial extracts with disfavor; in their opinion they were open to serious objections, and they were also strongly adverse to such pharmaceutical preparations as syrups and elixirs; but as the course of these men in this direction is a matter of history, comments in detail are unnecessary.

This innovation was strongly opposed at first by many talented physicians who disliked to change their methods, but gradually it was seen that the opponents to dosage by complex mixtures and polypharmacy, aimed to further a pleasant and advanced medication. Conspicuous dissenters from the principles enunciated by these advocates of a more direct and popular practice of medicine, came gradually to be staunch supporters of the principles advocated. That they were correct in their views, is shown by the trend of medical science.

Specific Medicines—In the beginning of this crusade against mixtures and compounds these classes of preparations were aggressively attacked, no words being spared in doing so. It was demanded that physicians who proposed to practice specific methods should use simple representatives of plants that had been gathered in their prime and worked by careful methods when in their best condition. Dr. Scudder gave superficial formulæ in his work *Specific Medication* for office manipulation of fresh drugs, and in this he made a serious mistake, for he was not a pharmacist and his pharmaceutical methods were not always productive of the products he desired. Consequently this defect in his book tended to discourage the person who attempted to follow the formulæ he gave, which, however, he stated were intended for country physicians who could not conveniently purchase the more concentrated remedies but who could procure fresh drugs from the fields and woods. Thus the eclectic medicines known as SPECIFIC MEDICINES were introduced as a line of eclectic remedies, each being labeled true to drug name, each depending for its position on legitimate pharmaceutical skill and care, and, as now prepared, all of them have been developed by years of study and the expenditure of much money in scientific experimentation.

Unquestionably the high standing they now occupy results from these many years of close application, not a little of which is comprised in the knowledge gained by the study of crude materials, the proper season for collecting drugs, and the conditions best fitted for their manipulation.

To sum up, the vegetable Specific Medicines are preparations of plants, each labeled under the full name of the drug yielding it. Each drug is worked in accordance with the process that experience has demonstrated is applicable to the abstraction, purification and retention of the medicinal constituents of that drug. The aim has been to exclude coloring matters as much as possible and inert extractive substances also from these preparations, consequently, with a few exceptions, they are light in color and yet they are very energetic. As a rule they represent the best quality of drug yielding them, minim for grain.

Specific Medicines are employed by physicians who desire clean concentrated liquid representatives of plants. In some cases Prof. Scudder used special chemical compounds and included them in his first list of specific remedies, these being still retained.

Homœopathic Mother Tinctures—These alcoholic preparations are admirable remedies in many respects, but lack the concentration to which eclectic physicians employing Specific Medicines are accustomed. They may not always be exactly uniform, different manufacturers and authorities, perhaps, varying their methods somewhat, and yet resultant differences are probably not sufficient to disturb dilutions made of them. The exceeding care directed by homœopathic pharmacopœias concerning the selection and gathering of crude material cannot but excite admiration, and although as a rule the mother tinctures represent less than one-tenth the drug used in making them (dry drug taken as a standard), still, aside from their deficient strength, they are excellent preparations. Eclectic physicians desirous of studying the *materia medica* of the homœopathic profession more explicitly will find an excellent treatise in the "Pharmacopœia of the American Institute of Homœopathy."

Briefly stated, each homœopathic mother tincture made of a plant represents nearly one-tenth the plant ("drug strength 1-10"), and is so recognized by those making and using them. But, as has been said, owing to the care in collecting the drug, the fact that in many cases the plant is not dried, and the explicit details of pharmaceutical manipulation, the resultant preparations are very clean and useful remedies. As a rule they are light in color.

Remedies for External Use—Passing now from plant preparations to other classes of pharmaceutical preparations, brief mention should be made of a series of preparations designed as external remedies. These begin with liniments which are

liquids, and pass by successive steps of gradation to plasters which are so hard as to be brittle when cold. The first to be considered, therefore, is the class known as the

Liniments—These are liquid at ordinary temperature, are usually oily mixtures, and often contain energetic drugs designed to be used by inunction. A number of formulæ for liniments are given in the Pharmacopœia, of which that for Ammonia or Volatile Liniment is a familiar specimen. In some cases, however, no oil is used, a typical example being Belladonna Liniment. In this connection I will say that the late Prof. John King used liniments extensively that were free from oils, the liquid employed as the medicine carrier being saturated solution of ammonium chloride. He claimed that better effects could be obtained by associating such substances as spirit of camphor, tincture of opium and aconite with this liquid as a carrier than by means of any fat or oil, to all of which he objected on account of their filth.

Ointments—These preparations are made of fats, such as lard and tallow, medicated, and are employed in a manner similar to liniments. They are, as a rule, of a stiff consistence in cold weather, but should melt at the temperature of the body. Hence, like liniments, they can be used to apply drugs by inunction. An excellent base is the official Simple Ointment (Ointment) made as follows:

“*Ointment*:—

Lard, <i>eight hundred grammes</i>	-	-	-	-	800 Gm.
Yellow Wax, <i>two hundred grammes</i>	-	-	-	-	200 Gm.

To make <i>one thousand grammes</i>	-	-	-	1,000 Gm.
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Melt the Yellow Wax, and gradually add it to the Lard; then stir the mixture constantly until it is cool.”—U. S. P.

As an example of a medicated ointment made by means of simple ointment, the Ointment of Carbolic Acid may be taken as an example:

“*Ointment of Carbolic Acid*:—

Carbolic Acid, <i>five grammes</i>	-	-	-	-	5 Gm.
Ointment, <i>ninety-five grammes</i>	-	-	-	-	95 Gm.

To make <i>one hundred grammes</i>	-	-	100 Gm.”
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Mix them thoroughly.

—U. S. P.

By employing Simple Ointment as a base, physicians can in like manner use any desired medicine therewith. In some cases aqueous liquids or aqueous extracts are to be incorporated with fats. This is often difficult; but if the physician will prescribe equal parts of Hydrous wool fat and simple ointment, large amounts of water or watery liquid will be taken up.

Cerates—Are made of fats and wax and are of such consistence, that at the temperature of the body, they remain plastic and do not melt. Thus they are designed to hold a remedy in contact with the skin, by excluding the air. As an example the official Simple Cerate (Cerate) may be cited as follows:

“*Cerate*:—

White Wax, <i>three hundred grammes</i> ,	-	-	-	300 Gm.
Lard, <i>seven hundred grammes</i> ,	-	-	-	700 Gm.

To make <i>one thousand grammes</i> ,	-	-	-	1,000 Gm.
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Melt them together, and stir the mixture constantly until it is cool.”—U. S. P.

Typical of familiar cerates of the olden time is the well known Cantharides Cerate or blistering cerate, a barbarous remedy often used inhumanly and without judgment. Happily, it is fast becoming obsolete, in the evolution that is rapidly retiring the abusive methods and medicines of mediæval days.

Plasters—These preparations are so stiff, that at the temperature of the body they are elastic and adhesive, but not soft. Hence when heated and spread on sheepskin or on muslin, and then applied to the skin, they adhere, maintaining their position. By this means remedies incorporated into a plaster may be held firmly in contact with the skin. The usual plaster base is known as Lead Plaster and is made according to the pharmacopœia as follows:

“*Lead Plaster (Diachylon Plaster)*:—

Lead Oxide, <i>three thousand two hundred grammes</i> ,	3,200 Gm.
Olive Oil, <i>six thousand grammes</i> ,	6,000 Gm.
Water, <i>a sufficient quantity</i> .	

Mix the Lead Oxide, previously passed through a No. 80 sieve, intimately with about one-half of the Olive Oil, by trituration, and add the mixture to the remainder of the Oil contained in a bright copper boiler of a capacity equal to at least four times the bulk of the ingredients. Then add *one thousand (1,000) cubic centimeters* of boiling Water, and boil the whole together, over a fire, constantly stirring with a wooden spatula, until a small portion when dropped into cold water is found to be pliable and tenacious. From time to time add a little Water to replace that lost by evaporation. When the contents of the boiler have acquired a whitish color and are perfectly homogeneous, transfer them to a vessel containing warm Water, and as soon as the mass has sufficiently cooled, knead it well with the Water so as to remove the glycerin, renewing the Water from time to time, as long as it may be necessary. Finally divide the mass into rolls of suitable size.

A yellowish-white, pliable and tenacious, but not greasy mass, gradually acquiring a brownish tint on the outside.

On treating 5 Gm. of Lead Plaster with 25 Cc. of benzol, a somewhat viscid and slightly turbid solution will result, which will separate into a clear and gelatinous layer after some time, but which should not deposit any sediment (absence of *uncombined lead oxide*).”—U. S. P.

Liquors or Solutions—These compounds are aqueous solutions of chemical substances. They are designed both for internal and external use and among them are to be found many energetic remedies. Thus Fowler's Solution of Arsenic and Donovan's Solution of Iodide of Arsenic and of Iodide of Mercury are samples of active remedies designed for internal use, while Solution of Subacetate of Lead is for use externally. Among the official solutions is to be found lime water (*Liquor Calcis*), Spirit of Mindererus (*Liquor Ammonii Acetatis*) and many other similar specimens of old-time pharmaceutical preparations, few of which, however, are employed by eclectic physicians.

Spiritus or Spirits—This class of preparations embraces the alcoholic solutions of such substances as oils, camphor, glonoin, etc. Among them is to be found Sweet Spirit of Nitre, Hoffman's Anodyne (Compound Spirit of Ether), Spirit of Ammonia (not ammonia water), Whisky, Brandy, Bay Rum, and similar alcoholic liquids. This class is quite voluminous and many of its members are extensively employed in medicine.

Medicated Waters—Under the term *aquæ* are to be found such substances as ammonia water, camphor water, chlorine water, distilled water, etc. The medicated waters embrace the popular aqueous solutions of oils and in these cases are made by first triturating the oil with calcium phosphate to effect its distribution over much surface, after which the mixture is abstracted with water. The following formula from the U. S. Pharmacopœia is typical of this class:

“*Peppermint Water*.—

Oil of Peppermint, <i>two cubic centimeters</i> ,	-	-	-	2 Cc.
Precipitated Calcium Phosphate, <i>four grammes</i> ,	-	-	-	4 Gm.
Distilled Waters, <i>a sufficient quantity</i>				

To make *one thousand cubic centimeters*, - - - 1,000 Cc.

Triturate the Oil of Peppermint with the Precipitated Calcium Phosphate, add the distilled Water, gradually, under constant trituration, and filter.”—U. S. P.

Among the medicated waters may also be found rose water and orange flower water, both of which are made by distillation of fresh flowers.

Medicated Wines—Among the earliest pharmaceutical preparations were to be found solutions of drugs in wine. The alcohol therein tended both to help exhaust plants and to preserve the product from putrefaction. Thus wine of ipecac is typical of wines made from a vegetable remedy. But all

medicated wines are not made of vegetable drugs; for example, wine of antimony is a solution of tartar emetic in wine. Among the wines are to be found the common beverages, white wine made by fermenting the juice of fresh grapes freed from seeds, stems and skins; and red wine made of colored grapes including their skins. These are used in preparing the medicated wines. Eclectic physicians use medicated wines very sparingly, with the exception of the old eclectic *wine bitters*, which is still a favorite with many.

Vinegars—This class of liquids contains acetic acid or vinegar. They were once used freely, but have fallen largely into disuse. The vinegars (aceta) are peculiarly adapted to alkaloidal drugs, and in early eclectic pharmacy such substances as vinegar of lobelia and vinegar of sanguinaria were popular. In the regular school of medicine vinegar of opium or *black drop* was once a favorite. The chief vinegar in use at present is vinegar of squill, which is employed in making syrup of squill. In this class may also be placed the *acetous emetic* compound of early eclecticism.

Emulsions are mechanical mixtures of oils and water, the admixture being facilitated by the influence of some body capable of affiliating them without chemically disturbing the oil. Yolk of egg, powdered acacia or powdered tragacanth are usually employed for this purpose. The Pharmacopœia recognizes emulsions made of gum resins, such as ammoniac and asafetida in which no foreign emulsifier is necessary. At present manufacturers have supplied emulsions that are made by means of machinery and are very thoroughly emulsified.

Elixirs—Originally the term elixir in pharmacy was applied to compound tinctures, and they were destitute of sugar. Thus Compound Tincture of Senna (Elixir Salutis) is an example of the original elixir. As a rule elixirs were nasty mixtures and harsh remedies, of which Compound Tincture of Aloes is a good specimen.

But about thirty-five years ago the compound, "Simms' Cordial Elixir of Calisaya," a sweetened and flavored cordial, was introduced. It was followed by other palatable *cordials*, and soon the term "elixir" was used in America in direct opposition to the original meaning. A great list of sweet alcoholic compounds followed, as trade elixirs, and a few are employed yet, but as a rule the elixir is now neglected. Physicians have learned that it is not advisable to give a tablespoonful of flavored syrup and a teaspoonful of alcohol in order to get a trifling amount of medicine.

Triturations—These mixtures are made of drugs and milk sugar, and are great favorites with homœopathic physicians. According to their methods two systems of trituration are employed, one in which one part of the drug is to be tritu-

rated with nine parts of milk sugar, the other in which one part of the drug is to be triturated with ninety-nine parts of milk sugar. The first method is known as the decimal system, the second as the centesimal system. For explicit details concerning these and other similar preparations the reader is referred to the Homœopathic Pharmacopœia. The U. S. Pharmacopœia directs as follows:

“*Triturations*:—

Unless otherwise directed, Triturations are to be prepared by the following formulæ:

Take of									
The Substance,	<i>ten grammes</i>	-	-	-	-	-	-	-	10 Gm.
Sugar of Milk, in moderately fine powder,	<i>ninety grammes</i>	-	-	-	-	-	-	-	90 Gm.

To make	<i>one hundred grammes</i>	-	-	-	-	-	-	-	100 Gm.
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Weigh the Substance and the Sugar of Milk, separately; then place the Substance, previously reduced, if necessary, to a moderately fine powder, in a mortar; add about an equal measure of Sugar of Milk, mix well by means of a spatula, and triturate them thoroughly together. Then add fresh portions of the Sugar of Milk, from time to time, until the whole is added, and continue the trituration until the Substance is intimately mixed with the Sugar of Milk and reduced to a fine powder.”—U. S. P.

In eclectic medicine, trituration of resin of podophyllum, both 1 in 10 and 1 in 100, and trituration of *carbo vegetabilis*, are much prized.

Confections are mixtures of syrup, honey, sugar and drugs. They have a pasty consistence, often being quite stiff. Confections are relics of mediæval pharmacy, once being very popular and very numerous. At present but two representatives are to be found in the U. S. P., one being Confection of Rose, the other Confection of Senna. Confections are not used at all in eclectic medicine.

Troches are related to confections, in that they are sugar compounds. They are, in fact, medicated sugar candy lozenges, many formulas for them being found in the pages of the U. S. Pharmacopœia. But they have only a limited use in eclectic practice, and, indeed, this may also be said for the majority of physicians in the regular profession. *Sugar Coated Pills* should be classified with troches. They came into use about thirty-five years ago, the first sugar coated pills I knew being imported from France under the term *dragées*.

Sugar Coated Pills are excellent forms in which to administer many inorganic drugs, and also solid extracts, resins, etc. Of late years they have been somewhat neglected by physicians who have become afflicted by the tablet craze, but, in my opinion, such neglect, in many cases, is without due consideration of the

relative claims of the respective remedies. Many vegetable substances that can be reduced to a plastic condition without serious injury, cannot be dried completely without rendering them valueless, or nearly so. These plastic substances can, however, be made into sugar coated pills, but in order to make tablets of any drug it must be dry as powder. Sugar coated pills are made by the simple process of first cutting out the pill mass, rolling it, and then coating the pills with sugar in a candy machine such as confectioners use to coat nuts. The risk that users of sugar coated pills have to guard against is the effect of the heat that is applied to the pill if it be reduced to a perfectly dry pill after being cut and before it is coated.

Gelatine Coated Pills—These, in my opinion, are superior to any and all other forms of candy or similar medicines. They have the advantage of being easily made out of very moist pill masses, and of being easily coated when still soft and moist, a feat that is impossible to accomplish with some drugs in the heated sugar coated machine. The gelatine excludes the air, preserves the contents of the pill, and is tasteless and harmless. I need say nothing stronger than that the gelatine pill is the only pill that I commend to my friends.

Tablets—These are related to the troches in that they are divided discs, but they are very different from troches in that no troche is illogical in its composition, while many tablets are masqueraders. Tablets are cheap machine stamped out pellets, and became popular very rapidly because of their neat appearance and convenient form. But the tablet craze was soon carried to extremes, much (as I believe) to the discredit of a line of preparations, that, had they been handled conservatively would have been exceptionally useful remedies. Many tablets are fine remedies, others are unworthy of confidence. The fact is though, either in over-zeal or from listening to indiscreet advisers, makers of tablets have been very injudicious, and have injured their interests in selecting tablet compounds that on their face are shown at once to be destroyed or much injured in the drying process. It seems as if the old eclectic resinoid blunder is being repeated. It therefore behooves physicians to closely scrutinize the natures of the substances that appear under the tablet label. In my opinion, certain physicians have been very thoughtless when they have displaced gelatine coated pills by means of tablets; but in this connection it is evident that thoughtful pharmacists and physicians are now looking seriously at the tablet subject, and it is probable that discriminative study concerning the remedies will ultimately exclude impractical formulæ. No tablet can be made to represent evanescent plant preparations or those in which alcohol is necessary as a preservative.

Suppositories—These are made of a concrete fat into

which various remedial agents are incorporated. They are designed for orificial medication, and are of various sizes and shapes. Oil of Theobroma (butter of cacao) is the usual fatty base, although about 10 per cent. of Japan Wax may be added to advantage in very warm weather. Several descriptions of suppository molds are sold by druggists' supply houses. According to the U. S. Pharmacopœia, suppositories should conform to the following conditions:

“ Unless otherwise specified, Suppositories should have the following weights and shapes, corresponding to their several uses:

Rectal Suppositories should be cone shaped, and of a weight of about *one (1) gramme*.

Urethral Suppositories should be pencil shaped, and of a weight of about *one (1) gramme*.

Vaginal Suppositories should be globular, and of a weight of about *three (3) grammes*.”—U. S. P.

In prescribing Suppositories it is to be expected that the physician will designate the medicinal ingredients and their porportion, as well as designate the size of the suppository and will leave the making of the suppository mass to the pharmacist who prepares them.

CLASSIFICATION.

GROUP I.

AGENTS ACTING ON THE NERVOUS SYSTEM.

- I. **Sedatives**—Agents that soothe and relieve nervous irritation and decrease nervous activity.
 1. **GENERAL SEDATIVES**—Agents which soothe the entire nervous system.
 2. **LOCAL SEDATIVES**—Agents which affect the nerves of a certain area only.
 3. **SPECIAL SEDATIVES**—Agents which influence special nerves.
- II. **Depressants**—Agents which entirely or partially inhibit or suppress nervous action.
 1. **ANALGESICS OR ANODYNES**—Agents which relieve pain by their depressing effect upon the nerve centers.
 2. **MOTOR DEPRESSANTS OR ANTISPASMODICS**—Agents which by their depressing effects on the different nerves allay or control muscular spasms or convulsions.
 3. **HYPNOTICS**—Agents which induce sleep.
 4. **NARCOTICS**—Agents which by their depressing effect on the brain center suppress the mental faculties, produce stupor, relieve pain and cause sleep.
 5. **ANÆSTHETICS**—Agents which are capable of producing a temporary condition of insensibility or loss of feeling.
 - (a) **General Anæsthetics**—Agents which affect the cerebro-spinal centers and produce a general loss of sensation and consciousness.
 - (b) **Local Anæsthetics**—Agents which produce a circumscribed loss of sensation in the organ or tissue to which applied.
- III. **Excitants**—Agents which excite the nerves to action beyond normal physiological limits.
 1. **DELIRIANTS**—Agents which derange the mental faculties and confuse the will power.
 2. **MOTOR EXCITANTS**—Agents which excite the motor nerves, causing irritation and muscular spasms.
- IV. **Stimulants**—Agents which excite or urge on the nerves to renewed or increased action within physiological limits.
 1. **GENERAL STIMULANTS**—Agents which influence the whole system.

2. **LOCAL STIMULANTS**—Agents which affect the nerves of a certain circumscribed locality only.
3. **SPECIAL STIMULANTS**—Agents which affect special nerves.

V. Analeptics—Corroborants.

1. **TONICS**—Agents which by permanently strengthening the nervous system, increase the ability of one or all of the organs to perform their normal functions.
2. **TROPHICS**—Agents which not only strengthen the nerves, but supply nourishment—actual nutrition, and restore waste material.

GROUP II.

AGENTS ACTING UPON THE HEART AND CIRCULATORY SYSTEM.

I. Cardiacs—Agents which exert a definite action on the heart.

1. **CARDIAC STIMULANTS**—Agents which urge on or incite the heart to increased action by their effect on the sympathetic nervous system.
2. **CARDIAC TONICS**—Agents which strengthen the heart.
3. **CARDIAC SEDATIVES**—Agents which decrease the action of the heart by their action on the cardio-inhibitory centers of the vagus.

II. Vasomotors—Agents that exert a definite influence on the vascular system.

1. **VASOMOTOR STIMULANTS**—Agents which increase the blood pressure by stimulating the vaso-constrictor nerves.
2. **VASOMOTOR TONICS**—Agents which strengthen, nourish and tone the walls of the blood vessels.
3. **VASOMOTOR SEDATIVES**—Agents which decrease the blood pressure by their action on the vaso-dilator nerves.

III. Antipyretics—Agents that reduce the morbid temperature of the body either (*a*) by an inhibitory influence on the heat centers of the brain, or (*b*) by decreasing the oxygenation processes, thus inhibiting the production of heat, or (*c*) by increasing the radiation of heat.

1. **ANTIPHLOGISTICS**—Agents which counteract and reduce inflammation.
2. **ANTIPEIODICS**—Agents which counteract periodic tendencies in disease; which antagonize periodicity.

GROUP III.

AGENTS ACTING UPON THE RESPIRATORY SYSTEM.

I. On the respiratory muscles.

1. **STIMULANTS**—Agents which increase respiratory action.

2. **DEPRESSANTS**—Agents which restrain respiratory action.

II. **On the lung tissue.**

1. **PULMONARY SEDATIVES**—Agents which soothe lung structure.

III. **On the mucous membranes of the air passages.**

1. **EXPECTORANTS.**

(a) **STIMULANTS**—Agents which increase the action of the mucous glands, increasing the function of the heart and circulation of the blood.

(b) **DEPRESSANTS**—Agents which decrease the function of the heart and nerve centers, and increase the action of the mucous glands. This includes Nauseants.

2. **ERRHINES OR STERNUTATORIES**—Agents increasing the action of the Schneiderian membrane.

GROUP IV.

AGENTS ACTING UPON THE STOMACH AND UPON GASTRIC AND INTESTINAL DIGESTION.

- I. **Emetics**—Agents that produce vomiting or emesis.

1. **SPECIFIC EMETICS**—Agents which act through the nerves. Their action may be either direct or indirect.

(a) Direct, when they act directly on the terminal branches of the pneumogastric nerve of the stomach.

(b) Indirect, when they act upon or through the vomiting centers in the brain.

2. **MECHANICAL**—Agents which act by irritating the mucous membranes of the stomach, or by their bulk.

III. **Digestives**—Agents that chiefly influence the process of digestion.

1. **DIGESTIVE FERMENTS**—Agents whose actions resemble the natural ferments of digestion, reinforcing the physiological process.

2. **ACIDS**—Agents which neutralize alkalies and aid the acids of the stomach.

3. **ANTACIDS OR ALKALIES**—Agents which neutralize the hypersecretion of acids.

4. **STOMACHICS OR GASTRIC TONICS**—Agents which strengthen and increase the normal functional activity of the stomach.

5. **HEPATIC STIMULANTS**—Agents which stimulate the functional activity of the liver.

6. **PANCREATIC STIMULANTS**—Agents which stimulate the functional activity of the pancreas.

7. **INTESTINAL STIMULANTS**—Agents which stimulate the functional activity of the intestines.

- IV. **Hepatics**—Agents which directly influence the functional activity of the liver.
1. **HEPATIC STIMULANTS**—Agents which incite the liver to increased activity. (See above.)
 2. **HEPATIC DEPRESSANTS**—Agents which decrease the activity of the liver.
- V. **Astringents**—Agents which when brought in contact with organic tissues cause these structures to contract and check secretions.
- VI. **Carminatives**—Agents that counteract and expel flatus from the stomach and intestines and relieve pain caused by it.
- VII. **Sialagogues**—Agents that stimulate the action of the salivary glands and increase the flow of saliva.
- VIII. **Antisialagogues or Antisialics**—Agents that suppress the action of the salivary glands and decrease the flow of saliva.
- IX. **Apositics**—Agents that allay hunger and destroy appetite.
- X. **Dentifrices**—Agents used in cleansing the teeth.

GROUP V.

AGENTS ACTING DIRECTLY UPON THE INTESTINAL CANAL.

- I. **Cathartics**—Agents which produce evacuations from the bowels by their action on the alimentary canal. They are:
1. **LAXATIVES OR APERIENTS**—Agents which are mild or feeble in their action upon the intestinal canal.
 2. **PURGATIVES**—Agents which act freely upon the bowels, inducing frequent semi-solid stools.
 3. **HYDRAGOGUE CATHARTICS**—Agents which produce watery stools by augmenting the secretions from the intestinal glands.
 4. **CHOLAGOGUE CATHARTICS**—Agents which act upon the liver, increasing hepatic secretions, and produce bilious discharges.
 5. **REFRIGERANT CATHARTICS**—Cathartics which have a tendency to reduce bodily heat.
 6. **DRASTIC CATHARTICS**—Agents which are the most powerful and quick in action, generally very irritating and violent.

GROUP VI.

AGENTS ACTING UPON NUTRITION AND THE BLOOD.

- I. **Restoratives**—Agents that supply some deficiency in the normal constituents of the body, either direct or by chemical reaction.

1. **HEMATICS**—Agents that supply some deficiency in the blood.

2. **FOODS**—Agents that supply nutriment which replaces waste matter in any part of the body.

3. **TROPHICS**—Agents which supply nutrition or which stimulate the tissues to partake of or absorb required nutriment.

II. **Alteratives**—Agents which increase metabolism or tissue change and encourage the removal of waste products.

GROUP VII.

AGENTS ACTING UPON EXCRETION.

I. **Diuretics**—Agents which by their action on the kidneys increase the secretion of urine.

1. **HYDRAGOGUE DIURETICS**—Agents which increase the watery element of the urine.

2. **DEPURANT DIURETICS**—Agents which increase the secretion of solids in the urine.

II. **Renal Sedatives or Depressants**—Agents that decrease the secretion of urine.

III. **Diluents**—Agents that increase the watery elements of secretions.

IV. **Antilithics**—Agents that counteract the formation of calculi.

V. **Diaphoretics**—Agents that increase the secretion from the skin producing perspiration.

1. **SUDORIFICS**—Agents which cause copious perspiration.

2. **SIMPLE DIAPHORETICS**—Agents that cause only a mild transudation from the skin.

VI. **Anhidrotics**—Agents that suppress or decrease perspiration.

VII. **Vesical Tonics**—Agents that restore the tone and function of the bladder.

VIII. **Vesical Sedatives**—Agents which relieve irritations of the bladder.

GROUP VIII.

AGENTS ACTING UPON THE GENERATIVE APPARATUS.

I. **Aphrodisiacs**—Agents that increase or stimulate the sexual power.

II. **Anaphrodisiacs**—Agents that reduce sexual desire or excitement.

- III. **Emmenagogues**—Agents that stimulate the menstrual flow.
- IV. **Hemostatics**—Agents that arrest or stop hemorrhage.
- V. **Uterine Tonics**—Agents that add tone and strength to the uterus to perform its natural functions.
- VI. **Uterine Sedatives**—Agents that lessen or decrease uterine contractions.
- VII. **Oxytocics or Parturifacients** — Agents that increase uterine contractions and aid and hasten parturition.
- VIII. **Ecbolics or Abortifacients**—Agents that produce uterine contractions, causing abortion.
- IX. **Anti Abortifacients**—Agents that counteract abnormal influences and morbid uterine contractions, thus preventing abortion.
- X. **Galactagogues**—Agents that stimulate the lacteal glands and increase the secretion of milk.
- XI. **Anti Galactagogues**—Agents that decrease the secretion of milk.

GROUP IX.

AGENTS ACTING UPON THE CUTANEOUS SURFACE.

- I. **Irritants**—Agents which when locally applied cause irritation, inflammation and pain.
 - 1. **RUBEFACIENTS**—Agents which produce redness of the skin.
 - 2. **VESICANTS**—Agents which produce blisters.
 - 3. **EPISPASTICS**—Agents producing serous exudation from the skin.
 - 4. **PUSTULANTS**—Agents that produce pustules on the skin.
- II. **Escharotics** (caustics)—Agents which when applied to the skin produce eschars.
- III. **Astringents**—Agents that cause a contraction of tissue.
 - 1. **REMOTE**—By absorption into the blood.
 - 2. **LOCAL**—By acting directly on the part to which they are applied.
- IV. **Styptics**—Agents that check bleeding by contracting the blood vessels or by coagulating the blood.
- V. **Emollients**—Agents which are used as external applications to soften and relax tissues.
- VI. **Demulcents**—Agents either oily or mucilaginous that are used to protect and soothe irritated mucous surfaces and other tissues.
- VII. **Protectives**—Agents that are used to shield, cover, or protect cutaneous surfaces.

GROUP X.

AGENTS ACTING UPON MICRO-ORGANISMS AND PARASITES.

- I. **Antizymotics**—Agents which counteract and prevent fermentation.
 1. **ANTISEPTICS**—Agents which prevent or destroy putrefaction or sepsis.
 2. **DISINFECTANTS**—Agents which destroy bacteria or disease germs.
- II. **Deodorants**—Agents which destroy or remove offensive odors.
- III. **Parasiticides** are agents that destroy parasites.
- IV. **Anthelmintics**—Agents which destroy and expel intestinal parasites.
 1. **VERMICIDES**—Agents which destroy worms.
 2. **VERMIFUGES**—Agents which expel worms.

GROUP XI.

MISCELLANEOUS.

- I. **Antidotes**—Agents that counteract or neutralize the action of poisons.
- II. **Antagonists**—Agents that oppose and counteract the action of other agents.

GROUP I.

Agents Acting on the Nervous System.

DIVISION I.

Sedatives and Depressants.

CHAPTER I.

AGENTS COMMONLY USED IN THE CONTROL OF FEVERS—ANTI-PYRETICS.

GELSEMIUM.	BRYONIA.	PHENACETIN.
ACONITE.	RHUS TOXICODENDRON.	ACETANILID.
VERATRUM.	ANTIPYRIN.	EXALGIN.

Note—The four following *Motor Depressants* are of first importance in the treatment of **fevers**. They may well be called *Special Sedatives*.

With our physicians the fact has become a cardinal principle that it is essential to keep the circulation and temperature as near as possible to the normal point. The severity of any acute disease is in proportion to the variation of these conditions from a normal standard, and in proportion as we are able to bring back to and keep these near to a normal standard are we able to correct and remove disease processes in which the circulation and temperature are influenced.

Excessive action of any character in any of the body processes must be restrained. A violent impression will produce a correspondingly violent reaction. The persistent, steady effects of small, frequently repeated doses of medicine, with no reaction, are in every way superior to the violent effects of large doses. The violence of the disease is to be fully considered, however, and the dose prescribed accordingly.

The progress of fever, its unarrested violence, is often the cause of localized inflammation—not always the result of it. Suppressed secretion is the cause of the fever in many cases, and the fever in time determines which is the susceptible organ, for there inflammation becomes seated.

Again, the severity of any acute inflammatory disorder depends upon the severity of the fever, and the control the physician is able to exercise over the fever determines the amount of control he exercises over the processes of the inflammation. No fever, however mild, should come to the

knowledge of the physician, especially in children, without its being at once antagonized by the properly indicated remedy.

Masius and Stockweiss, Semmola and others, confidently assert that fever is not an essential process to natural climination and must be restrained.

In continued fevers the reaction which will follow the powerful depressing effects of large doses of active coal tar antipyretics is more injurious than the fever processes, if such reaction occurs. If not, the depression is apt to be fatal.

In continued fevers the steady impression induced by small but frequent doses of those agents which restrain heart action and heat production by their tonic effect upon the nerve centers and vital processes, is in every way superior to the large doses of the commoner synthetic antipyretics. The depressing action of the latter, without compensation, is entirely too great.

And yet it is our duty to present this class of remedies as fever remedies, inasmuch as they are potent in that influence. They are so considered farther on in this group.

GELSEMIUM,

GELSEMIUM SEMPERVIRENS.

Synonym—Yellow jasmine.

Part Employed—The rhizome and roots.

Natural Order—Loganiaceæ.

Locality—The southern United States.

History—Though classed by Tully as a narcotic, it first came into prominence as a remedy in the treatment of malarial fevers of the southern United States.

Botanical Description—The *Gelsemium Sempervirens* used in medicine is a climbing vine, ascending lofty trees, and growing in moist woods, from Virginia to Alabama, and flowering from January to April, forming beautiful festoons from tree to tree, covered with large yellow, fragrant blossoms. The vine always runs to the top of the tree on which it fastens, and spreads out in a thick foliage. The vine is of the same size at the top as at the bottom. The stem is twining, smooth, shining, hollow and of a green or purplish color; leaves perennial, lanceolate, opposite, entire, ovate, membranaceous, smooth, shortly petiolate, dark green above and pale green beneath; flowers yellow, in axillary clusters or solitary, calix small, corolla five-lobed, funnel-shaped, 1 1-2 inches long, with nearly equal border, five stamens, three pistils, fruit flat, brown, in a two-celled compressed capsule, 3-4 in. long, four to six alate seeds in each cell attached to the margins of the valves.

The rhizome, which runs just under the surface of the ground, is from fifteen to thirty feet long, and about an inch in diameter; externally snuff colored with purplish longitudinal lines, breaks with a tough splintery fracture; is of an intense yellow

color within, bark thin with a silky fibre, wood porous with whitish medullary rays, dark colored pith, rootlets same color as rhizome with longitudinal wrinkles, numerous scars and yellowish diploe; odor heavy, aromatic, taste pleasantly bitter; solvent, dilute alcohol.

CONSTITUENTS—Gelsemine, Gelsemic Acid, Gelseminine, Volatile Oil, Gum, Starch, Resin.

PREPARATIONS—*Extractum Gelsemii Fluidum*, Fluid Extract of Gelsemium. Dose, from one-half to five minims.

Tinctura Gelsemii, Tincture of Gelsemium. Macerate and percolate with dilute alcohol. Dose, from five to thirty minims.

Specific Gelsemium. Dose, from one-third to two minims, prescribed ten minims to two drachms in four ounces of water. Teaspoonful every half hour to two hours.

Administration—Gelsemium is a prompt remedy if given in sufficiently active dosage. The excellent results obtained by the older physicians were obtained from full doses. Children are more susceptible to its action than adults, and with them the smaller dosage is applicable. In spasms the maximum dose is needed. If toxic effects are obtained they are readily observed and antagonized with no harm to the patient.

Gelsemium is quickly eliminated from the system, largely through the kidneys, consequently the effects of single doses are quickly dissipated, and the doses must be given frequently, especially in childhood, to insure good results. Single full doses should be given only to adults.

Physiological Action—Usually upon the administration of an overdose of this agent there is at first some excitement, followed by depression of the nervous system, with dizziness, amblyopia, double vision, dilated pupils, exophthalmos, complete prostration, with drooping of the upper eyelids from paralysis of the levator palpebræ superioris and inability to keep the jaw closed. The temperature is reduced, the force and frequency of the pulse is lowered, with dyspnoea, the breathing being accomplished with much effort, and death usually results from paralysis of the respiratory muscles, including the diaphragm. The influence appears to be exercised upon the base of the brain, on the splanchnic nerves and on the spinal cord. It inhibits the nerve force of all the visceral organs and relaxes the sphincters. Convulsions are one of the results of poisonous doses in animals. In man, while there is loss of sensation and motion, the patient is conscious of what is going on around him, unless the symptoms are prolonged, when deficient oxygenation of the blood, with accumulation of carbonic acid, will produce coma.

In experiments made upon pigeons the effects are very similar to those resulting from destruction of a portion of the cerebellum. There are irregular backward movements, tremblings, flutterings of the wings, preceding complete paralysis.

Gelsemium in lethal doses paralyzes the nerves, both sensory and motor. The motor nerves are first influenced, the paralysis of sensation more slowly following. The writer observed a case of poisoning where the patient had taken sixty minims of the fluid extract within forty-five minutes. A sensation of general oppression occurred rather suddenly. The patient arose to her feet, noticed that vision had failed almost completely, walked two or three steps, then fell in a mass upon the floor in a state of complete muscular relaxation. There was no alarm or fear, a rather tranquil feeling mentally, and in this case there was no great difficulty of breathing, although we have observed dyspnœa from single doses of two or three minims of the fluid extract. The recovery of this patient was rapid, although muscular weakness was present for several days.

Specific Symptomatology—The indications for this agent are **fever**, with a high degree of nervous tension, great nervous irritation, exhibited by bright eyes, usually with contracted pupils, though in some cases the pupils are widely dilated. The face is flushed, there is restlessness, usually with increased temperature, with sharp, quick pulse, all evidences of acute determination of the blood to the brain or central nervous system. Here gelsemium is a sure remedy, through its inhibiting power over excessive action in these centers. Given in sufficient doses it slows the heart's action, reduces the temperature and quiets the respiration, speedily producing a restful sense of tranquility.

Therapy—In all **fevers** with the nervous phenomena described above it is the remedy. In **spasms** of **childhood** following the indications mentioned, no remedy is more certain. It is specifically antispasmodic and relaxant. In **puerperal convulsions**, with these conditions, or in **puerperal fever**, full doses of this agent give extreme satisfaction. In convulsions from nervous excitement from exhaustion, in asthenic cases, it is contra-indicated. In the early stages of fever with nervous excitement it is the direct remedy. In excitable mania with restlessness and sleeplessness, either alone or combined with hyoscyamus, its effects are satisfactory. It is an excellent sedative in the early stages of inflammatory disease of any organ with high fever, high nervous tension and restlessness. It is especially valuable in **spinal**, **cerebral**, or **meningeal** inflammation. It may be given in full doses for a short time. In none of these cases should it be continued past the sthenic stage. It has been given with good results in many cases of **tetanus**, especially in the initial stage when the spasm of the masseters is the only prominent symptom. In the latter stages it cannot be given in doses large enough to relieve the muscular spasm without paralyzing the respiration and materially impeding the oxidation of the blood. It has been given hypodermically in tetanus in the horse with complete cures.

Gelsemium should be given with confidence in **chorea** with great restlessness and ready inclination to nervous excitement. It must be given in full doses. To a child of eight years two drops of the Specific Gelsemium may be given four times daily. Rest in bed should be insisted upon, and the proper treatment of other existing conditions, especially the anæmia and deficient nutrition.

It is a remedy for **neuralgia**, but as its influence is exhibited more immediately over the cranial nerves, then upon the spinal nerves, apparently from above downwards, it cannot usually be given in doses sufficiently large to control sciatica and neuralgia of the lower spinal nerves without exercising too great a paralyzing influence upon the nerves of the face and eyes, and upon the respiration, evidenced by diplopia due to paralysis of the third pair, dyspnœa, and increasing muscular weakness. It is a specific in facial neuralgia, in neuralgia of the fifth pair, and in headaches from cerebral excitement or engorgement.

It is servicable in **migraine**, in **rheumatic stiffness** of the muscles of the neck, and in recent cases of **torticollis**.

In **asthma**, from nerve irritation, in **whooping cough** and in **laryngismus stridulus** it is a good remedy. In **reflex cough** from nerve irritation it is indicated, and in **spasmodic cough**.

It soothes an **irritable heart** and relieves **cardiac neuralgia**. In **palpitation** and irregular heart action from reflex gastric irritation it is a speedy and sure remedy. In these cases the results are increased often by a combination with *cimicifuga*.

It is a remedy for **acute nephritis** from cold, as it quickly reduces the increased arterial tension and the quantity of albumen, and increases the quantity of the urine. There is no more soothing agent than this in its influence upon the nerves of the entire urinary apparatus. It controls pain in spasm of the bladder, in fact any irritable pain in the passage of the urine, or in retention of urine. Its influence is especially marked in **acute cystitis** with great irritation and spasm. In spasm of the urethra, in **spasmodic stricture**, its influence is sometimes seen within an hour. No agent is as prompt. Its influence in acute gonorrhœa is excellent.

In **neuralgic dysmenorrhœa** gelsemium is directly indicated. It controls **ovarian neuralgia**. It suspends **after-pains**. It is not a safe remedy with which to control these pains, as it relaxes normal muscular contraction and permits uterine hemorrhage. It relaxes a rigid os uteri; but it suspends the normal contractions and pains at the same time.

If given in full doses at the onset of **puerperal fever** it relieves the pain and often abates the fever, if septic matter is removed.

Co-operative Agents—*Cimicifuga racemosa* is an excellent agent with which to combine gelsemium where the muscular

system is involved. It promotes the action of gelsemium in all heart troubles, and in irritable and inflammatory conditions of the entire urinary tract. Opium intensifies the effects of this agent, but is slower in its action and its effects are not so quickly dissipated. They are not often prescribed together by those who are familiar with the action of gelsemium. Other agents which act harmoniously with it to a greater or less extent are *passiflora incarnata*, the bromides, and chloral hydrate, *conium maculatum*, *physostigma* and *veratrum*. It works nicely in fevers in careful combination with aconite.

Antagonists—This agent is antagonized by alcohol, by strychnia, *nux vomica*, *digitalis*, ammonia and, to a certain extent, by belladonna and caffeine.

Antidotes—In overdoses, heat applied, with electricity, and alcoholic stimulants, friction, artificial respiration, and hypodermics of atropine or strychnine should be administered. Strong coffee is also an antidote.

ACONITE.

ACONITUM NAPELLUS.

Synonym—Monkshood.

Part Employed—The root of the second year and leaves.

Natural Order—Ranunculaceæ.

Locality—Europe, Asia, North America.

Botanical Description—Aconite is a perennial herb; stem two to five feet high, simple, straight, erect, round, leafy, with the inflorescence at its termination; leaves two to four inches broad, palmately five to seven lobed, lobes trifid, their segments slashed, linear, acute, petioled, dark green above, lighter beneath, smooth, shining, divisions wedge-shaped, with two or three lobes extending midway; flowers large, violet-blue, sometimes white, hairy in terminal racemes on short pedicels; racemes simple, cylindrical; petals five, upper ones helmet-shaped, convex, gradually tapering to a point, the lateral ones hairy inside, the two lower oblong-oval, nectariferous; fruit three to five pod-like capsules; root conical, half to one inch thick at the crown, two to three inches long, tuberculated from scars of rootlets broken off, brown, wrinkled, hairy, inside whitish; inodorous, the radish-like odor of the fresh root disappears on drying; taste sweetish, then acrid and burning, with a persistent sense of numbness; bark thick, central axis seven-rayed; solvent, alcohol.

Dose, from one to two grains.

CONSTITUENTS—Aconitine, Pseudo-Aconitine, Aconine, Pseudo-Aconine, Picroaconitine, Aconitic Acid, Sugar, Fat, Resin.

PREPARATIONS—Extractum Aconiti Radicis Fluidum, Fluid Extract of Aconite Root. Dose, one minim.

Tinctura Aconiti Radicis, Tincture of Aconite Root. Dose, from five to ten minims.

Specific Aconite. Dose, from one-twentieth to one-half minim.

Physiological Action—In a moderate dose of five minims a sense of numbness and tingling is felt in the tongue and lips, with muscular weakness and depression; by doubling the dose these symptoms are intensified and prolonged, the pulse falls and the breathing is slowed. A poisonous dose causes tingling in the skin, pain in the joints, vertigo, dimness of vision, extreme debility, pulse forty to fifty per minute and irregular, skin cool and moist, burning heat in the œsophagus and stomach, nausea, vomiting and purging. There may be severe gastric and intestinal spasms, headache, complete loss of sight, hearing and speech, while consciousness remains; pupils dilated, muscles tremulous or convulsed, pulse imperceptible; death by syncope.

Aconite acts on the vaso-motor nervous system. It is a powerful depressant of the heart, and if given in sufficient quantity will paralyze that organ. Its apparent influence is upon the terminal filaments of the sensory nerves first, and afterwards, more slowly, upon the nerve trunks. It depresses the nerve centers of the cord, and destroys reflex activity and voluntary power.

Specific Symptomatology—Aconite is specifically the heart sedative in **sthenic fever**. It is contra-indicated when that stage is passed. It must be discontinued when the fever is accompanied with feebleness of the heart's action, however rapid the pulse, or however high the temperature, or when there are evidences of failure of nerve power. It is directly indicated when the pulse is small, hard, sharp and quick, the skin dry and hot, the secretions suppressed, chilliness up and down the spinal column, a shivering when the bed cover is removed, or when the body is exposed to the air. This latter symptom is present in many cases at the onset of continued fever. It is also indicated by the full, hard pulse, or the wiry pulse in the initial stage of the acute inflammation of any organ, and at the onset of protracted fevers and exanthematous diseases.

Therapy—The field of the remedy, as a sedative, is consequently a wide one, and in its field it is as specific as any agent known. It has become the greatest of the agents used by the profession, in its entirety, in the control of fever; but its exact indication must be complied with.

At the onset of fever Aconite is the remedy. At that stage of the disease when the evidences of some disorder are apparent, and yet its localization cannot be determined, the indications for treatment pronounced, why should the physician wait until a group of symptoms appear that have a name—that is known as disease—when the indications for one remedy are so conspicuous? We have known of many cases where all the

evidences of approaching inflammation were plainly apparent, where the initial fever has been promptly met with Aconite, and no inflammatory condition has ever developed. It is the experience of all physicians.

Aconite is specifically the fever remedy in childhood. Infants are susceptible to minute doses often repeated, and it is kind and soothing in its action. Five drops of the tincture to four ounces of water given in teaspoonful doses is the maximum dose for a child one year of age. Because of its prompt action and ready elimination the doses must be given frequently—every half hour or hour. As soon as the sedative influence is apparent, the skin becomes moistened, the restlessness abates and the temperature falls, the doses must be reduced in size or in frequency until no longer indicated. Simple fevers will abate in from four to twelve hours under this administration of Aconite.

Aconite promotes tone and power in the arterial capillaries, and is opposed to blood stasis. In this influence it has a powerful auxiliary in belladonna. The two agents, in small doses, work harmoniously in incipient inflammation. Their combined influence in capillary engorgement is most salutary.

At the onset of inflammation, the synthetic heart depressants will perhaps stay the fever, but their influence is not so beneficially exercised upon the inflammatory processes. If inflammation is in progress they will not prevent its results. Aconite retards exudation, suppuration, adhesion, induration and hypertrophy. This can by no means be as truly said of any other agent. Aconite certainly antagonizes inflammation or inflammatory processes and their results. This is partly due to its characteristic influence upon the capillary circulation. It hastens resolution and promotes rapid absorption of inflammatory products.

Under the influence of this agent there is an entire change in the heart's action. The heart beats more slowly and quietly, the pulse becomes fuller and more natural, there is a general soothing effect upon the nervous centers, and the natural secretions from all the emunctories are re-established. It promotes free diaphoresis and is thus especially indicated when the skin is dry and hot. The mouth is no longer dry, the eyes assume a more natural appearance, and there is a large increase of the urinary secretion. The arterial tension is materially lessened. It has a direct effect on the heat centers, inducing marked reduction in temperature. It is due to this influence that it is so reliable whenever there is an excess of body heat.

In acute **congestion** or in inflammation of the **brain** and spinal cord or their meninges, this agent exercises a double influence in the initial stages, but as soon as prostration or lack of power is evidenced it must be discontinued. In **cerebro-spinal meningitis** of infancy, with gelsemium and other antispasmodic

sedatives, its influence is of prime importance. Acute discrimination must be exercised as to the limits in which it will be useful.

It has a direct influence on respiration and upon the respiratory organs. In **pneumonitis** its influence upon the capillary circulation is so pronounced that it is impossible to overlook its benefits. Usually for the first five days of the fever its indications are conspicuous and no remedy will take its place. If given with veratrum at this time the violence of the circulation and temperature is restrained more promptly. In **bronchitis** it allays irritation, restores secretion, and by its paralyzing effect on the end nerve filaments quickly soothes the irritable or inflamed condition of the mucous membrane.

In **pleuritis** it is the first remedy to be thought of in the initial stage. Its influence is enhanced here by the use of *asclepias tuberosa*, and by alternation with *bryonia*. The chilliness, cutting pain on respiration, sharp cough and dry skin and mucous membranes, all point directly to it; but as soon as effusion to any great extent occurs, the agent may be dropped and the other agents continued. Better results may then be obtained by the occasional use of small doses of salicylate of sodium in addition to the other remedies mentioned.

It is of essential value in the treatment of mucous and serous inflammations. Its influence is evidenced in a marked manner in the treatment of acute **enteritis** or **peritonitis**, local or diffused, idiopathic, traumatic or septic. In gastritis, appendicitis and hepatitis; in acute **nephritis**, cystitis or urethritis, specific or non-specific, it is the first indicated remedy and may be continued until asthenia appears. In acute catarrh and other similar inflammations it may be persisted in as long as the inflammation lasts.

In acute **gastritis** and in gastric fever and in acute **enteritis** it is an admirable agent. Its influence here, as in throat troubles, is partly due, although to a much less extent, to its local as well as its general influence. In the inflammatory stage of **dysentery** and **cholera infantum** minute doses of ipecac and aconite exercise a specific effect when the causes of the disease are removed and intestinal asepsis secured.

In the onset of **diphtheria** it is an essential auxiliary. In acute tonsillitis, pharyngitis or laryngitis its specific influence is conspicuous because of its local as well as its constitutional effects. Minute doses will often abort a case of **croup** or terminate it abruptly. Its internal administration in acute inflammation of the throat or post-nasal mucous membrane is greatly enhanced by a warm spray which contains aconite in an appreciable quantity.

In the treatment of continued or **septic fevers** aconite is usually indicated at the onset, but as soon as impairment of the

blood, by the influence of high temperature and rapid destructive metabolism, with defective excretions of the waste products, is apparent, the agent must be discarded. The nerve force is deficient by this time and depressing agents are contra-indicated. This is especially true in typhoid conditions. The changes take place early, and the period of aconite indications is very short. Cactus grand, organic antiseptics and bryonia will produce a sedative influence, and we will find their indications conspicuous when the time for aconite has passed.

Aconite is of value in the treatment of **rheumatism** and rheumatic fever. In addition to its general influence upon inflammatory conditions it is a great promoter of excretion. It is combined to an advantage with cimicifuga, sodium salicylate, bryonia or rhus tox.

In **exanthematous disease** aconite is doubly indicated because of its direct action upon the capillary circulation of the skin. It assists in determining the eruption to the surface and promoting exfoliation. It curbs the temperature and prevents complications and conduces to a normal condition of the mucous surfaces, which is important where those surfaces are in danger of being involved also.

In acute **mastitis**, if treatment is inaugurated at once, an actual specific effect is accomplished by administering a full dose of aconite with ten drops of the tincture of phytolacca decandra, one hour, and alternating it the next hour with aconite and ten grains of acetate of potassium. But few doses will be given until abatement of the active symptoms will be observed. The same course may be advised in prostatitis or acute orchitis with similar results. In **metritis** it has a prompt influence and gives excellent satisfaction.

Aconite is a remedy of prime importance in the treatment of **amenorrhœa** when the suppression results from acute cold. It is conjoined with other measures indicated, and is prompt and satisfactory. Cimicifuga enhances its influence here, as well as polygonum punctatum. When the secretion of the skin and mucous membrane is restored by aconite, a full dose of quinine will sometimes accomplish the desired result, when it would accomplish nothing without this agent.

Aconite is so assuredly a specific in febrile conditions that its influence in chronic diseases is almost entirely overlooked. It is in certain chronic and non-febrile conditions a very reliable remedy because of its certain action upon the nervous system. John King advised its use in treatment of non-febrile **spinal irritation** in young women, and the writer has followed his suggestions in this condition for years with superior results in many cases.

Its direct influence upon the cerebro-spinal system is recognized by homœopathists. Deschere says: "Aconite is useful in

mental diseases and hysteria when there is particular aversion to excitement; the patients show an intolerance of music; they can bear no sounds."

Aconite is an important remedy in the treatment of **affections of the heart**. The symptoms indicating it in these cases are numerous and important, and necessarily so, since aconite restrains the blood flow and also exerts a special action on the heart and its nerves. There are congestions of both heart and lungs, palpitation with anxiety, cardiac oppression and even syncope. The palpitation is worse when walking, lancinating stitches occur and prevent the patient from assuming an erect posture or taking a deep inspiration. Attacks of intense pain at times extend down the left arm from the heart and are associated with numbness and tingling in the fingers.

The agent is advised by many in **angina pectoris** when there are strong contractions or pure hypertrophy, but not in enfeebled heart or where there is much valvular insufficiency.

In **reflex vomiting** without prostration or exhaustion aconite is useful. This is especially true in some cases of the vomiting of pregnancy.

In neuralgia it is of use externally as well as internally. The aconitine, in granules, is the best form for its internal administration in neuralgia. Externally the tincture may be applied.

Aconite is of great service for external use in liniments because of its anæsthetic influence upon the nerve endings. It is of common use in local pain to relieve congestion, irritation and distress. Perhaps the most immediate influence obtainable in acute pain is to pour ten drops each of chloroform and aconite into the palm of the hand and hold it over the seat of the pain for two or three minutes. The effect is instantaneous and marvelous. It may be used in this manner in acute stomach or bowel pains until the cause of the pain is removed by other measures, or in acute pleurisy, and especially in angina pectoris. The pain ends with the application, and measures can be adopted to prevent its recurrence. Any local pain or neuralgia will yield, for a time at least, and in many cases it will not return. Sciatica treated two or three times per week with this simple formula will soon cease to return. The measure is too simple to confirm faith in its value except by the good results obtained from its repeated use. It is more prompt than the hypodermic.

We have observed that aconite intensifies, modifies and otherwise improves the action of several other agents with which it may be combined or alternated. The characteristic effects of *cimicifuga racemosa* will occur in one-third of the time with this remedy than when given alone. The influence

of belladonna upon all local congestions and in equalizing the general circulation is intensified in a characteristic manner when the remedy is given with, or alternated with aconite. Given in proper doses with *veratrum* the influence of both remedies is active. Their influence on serous inflammation is most marked. In many cases either alone will not produce the same results.

Given with *gelsemium* in nervous excitement, cerebral fullness, nervous twitchings and fevers which result from irritation of the nerves and nerve centers, the effects of both are heightened.

Given with *asclepias tuberosa*, with proper external means, hardly any other agent will be needed in acute pleuritis.

Veterinarians find aconite immensely beneficial in the treatment of the inflammatory diseases of animals; but objections arise from the treatment of disease in horses, from the fact that horses are much more susceptible to its action than man. A correspondingly smaller dose must be given, and repeated quite often.

Toxicity—Poisoning by aconite is not common. An overdose produces in the mouth and throat a tingling sensation, followed by symptoms of strangulation from paralysis of the nerve endings. The tingling becomes quickly general. This is followed by a sensation of numbness. The skin, relaxing, becomes covered with a cold sweat, and finally becomes cold. The patient becomes too weak to stand, the respiration is greatly depressed and insufficient, the heart beats more feebly and the pulse may vary every few minutes in its character, but it is always weak. The temperature falls rapidly. Aconite depresses the heat centers, and, by dilating the capillaries of the skin, permits rapid heat radiation, at the same time acting in a two-fold manner upon the temperature. Consequently the temperature of the surface of the body is a correct criterion by which to judge of the internal temperature.

There may be vomiting, failure of the special senses from the general paralyzing effect of the agent, syncope or mild delirium and convulsions. These symptoms are not usual.

Antidotes—If a full toxic dose be taken, the above symptoms advance most rapidly, and no time whatever should be lost in combating the influence of the agent. It has no known physiological antidote. The conditions must be met according to their indications. If there is any reason for believing that the stomach contains any of the agent, large quantities of warm water should be swallowed and immediately evacuated. It may be vomited or siphoned out with a long stomach tube, or pumped out, but extreme nauseating emetics are contra-indicated. A mild infusion of oak bark, drunk freely, serves the double purpose of diluting the aconite and antidoting it by the tannin it

contains. Tannic acid is believed to be a chemical antidote to a limited extent, and given in suspension in water is efficient.

The most immediately diffusible stimulants must then be given freely. Alcoholic stimulants, ammonia, capsicum in a hot infusion is a most serviceable remedy and digitalis, strophanthus or atropine by hypodermic injection, or nitro-glycerine. External heat continually and electricity.

VERATRUM.

VERATRUM VIRIDE.

Synonym—American Hellebore.

Part Employed—The rhizome and roots.

Natural Order—Liliaceæ.

Locality—North America.

Botanical Description—American Hellebore is a large perennial herb growing in swamps and low grounds, and flowering in June and July; stem two to seven feet high, cylindrical, solid, striated, pubescent, pale-green, unbranched except in the inflorescence; leaves five to eight inches long, half as wide, oblong, acuminate, sheathing the stem, pubescent, plaited, nerved; flowers numerous, polygamous, nearly sessile, green, in compound racemes, axillary from the upper leaves, terminal, the whole forming a sort of panicle; peduncles downy, bracts boat-shaped, downy; sepals pilatoid; fruit capsule in three follicles, one inch long, united together, separated at top, opening on the inner side; seeds flat, winged, imbricated; rhizome thick, fleshy, truncated above, lower half solid and sending forth a multitude of rootlets, blackish-gray externally, grayish-white internally, with many short wood-bundles; rootlets five to ten inches long, one-twelfth inch thick; inodorous, taste bitter, acrid; solvent, alcohol.

Dose, from one to two grains.

CONSTITUENTS—Veratroidin, Jervine, Pseudo-Jervine, Rubijervine, Cevadine, Starch, Resin.

PREPARATIONS—Tinctura Veratri Viridis, Tincture of Veratrum Viride. Dose, from two to ten minims.

Specific Veratrum. Dose, from one-tenth to five minims.

Physiological Action—Taken in moderate doses, Veratrum Viride reduces the pulse rate in a marked degree, which becomes extremely rapid and feeble on any exertion; this condition is followed by severe nausea and vomiting, together with muscular weakness. Taken in a poisonous dose these symptoms are increased in severity, the pulse becomes almost imperceptible, the skin cold and clammy, together with vomiting, retching, hiccough, faintness, dizziness, blindness and unconsciousness. These symptoms indicate that the drug is a powerful spinal and cerebral depressant.

Although Veratrum is a powerful poison, it is so regular and uniform in its action, and so devoid of erratic and unaccountable or uncontrollable influences, that it can be given within the limits of its maximum dosage with safety.

In overdoses it produces vomiting, usually before enough is absorbed to produce serious results. It is not rapid or violent in its first effects and is not cumulative. It is quickly eliminated and the effects of single doses are transient. It can be watched even when the doses are large, and stopped before harm results. It is really the safest of our active agents. Its poisonous effects are easily antidoted. It is better given in small doses, repeated every half hour or hour, in acute cases, as its influence is exercised in a more uniform manner, is more permanent, is more easily controlled and is not so apt to disturb the stomach. A large dose produces quick depression, although the effect is transient. If the dose be often repeated, the stomachic irritation quickly becomes so great as to interfere with all medication.

Veratrum is a better remedy for adults than for children. It is not as easily adapted to infants and the feeble as Aconite, and its manner of action is not as satisfactory.

Veratrum, in its direct heart depression, resembles the coal-tar depressants, although much more regular and uniform in its action and perfectly controllable. It steadily slows the heart and circulation, the temperature declining correspondingly. Its influence upon the emunctories is not marked. Aconite influences the heat production and heat radiation, stimulates all emunctories and the function of all the glandular organs and hastens the removal of inflammatory products. Effusion or suppuration are thus prevented, and if this agent was begun early, when the temperature has declined, there are no local lesions remaining to contend with as the results of the inflammatory action.

Veratrum will assist in the removal of morbid products, but not with the immediate influence upon the results of inflammatory actions that are apparent from the use of Aconite. Veratrum should not be given when inflammation has resulted in marked structural change and the products of inflammation are plainly present. Here Aconite may be given as long as no general depression occurs.

Specific Symptomatology—Veratrum is indicated in the onset of **sthenic fever** when the pulse is full, large and bounding, and the tissues are engorged, where there is fullness of the capillary circulation.

It is especially serviceable when there seems to be obstruction of the venous capillary circulation. The face and skin are flushed, but usually of a full, dull, dark hue, and not always the bright-red flush with hot, dry skin which indicates aconite

and gelsemium. The skin is usually soft and covered with warm perspiration. In these cases Veratrum removes the arterial pressure and permits or even assists the more rapid removal of the venous obstruction.

Therapy—The characteristic indications for Veratrum are found in the onset of **pneumonia** in strong men previously healthy and vigorous. In these cases, given in doses of a drop of the tincture every half hour, it will slow the pulse and slowly reduce the temperature after four or five hours. This effect can be continued for a few doses longer, and then the doses should be smaller or given farther apart. The pulse should be slowed, in a case with violent premonitory symptoms, down to the normal beat and held there for awhile, and if the symptoms do not quickly abate, the influence may be continued until a pulse sixty or fifty-five, or even, in a strong man, fifty beats are reached, if the stomach be not yet irritated.

In **pleuritis**, in **bronchitis**, in **peritonitis**, especially pelvic peritonitis from sepsis; in **hepatitis** and **nephritis** and **cystitis** always at the beginning of the acute stage before much structural change has occurred, it may be given, and will retard and often throw off the attack. It is of value in the earlier stages of **meningitis** and **cerebritis**, and its effects will be salutary if given understandingly. If the violent heart action be controlled, the processes of disease and any tendency to convulsive action will be at once restrained.

In continued fevers this agent, like other depressants of nerve force, is not always the best remedy to use. The reactionary power of the nerve centers is greatly lowered by disease, and if depressants are given they are apt to still further decrease the nerve force and minimize its restorative influence over the system. Advantage will sometimes follow its early use in a case of extremely high temperature with violent and noisy delirium, but it is not the remedy to persist in nor to continue when the prostrating influence of the fever is apparent.

In **tonsillitis** aconite as an internal remedy is almost specific, but its influence is greatly heightened and the inflammatory stage shortened by applying Veratrum with a camel's-hair pencil over the tonsils. Diluted—one dram in a half-glass of water—it is an excellent gargle in any inflamed throat. In these cases it aborts the inflammation and determines immediate resolution.

In **erysipelas** it is of value both internally and externally. For external use in this disease a somewhat dilute non-alcoholic preparation is preferable, or the fluid extract, full strength or diluted one-half.

It is seldom that other applications will be needed, and the force and frequency of the heart's action can be well restrained by its internal use. If begun early in erysipelas, there are few conditions likely to arise that will contra-indicate its use.

In its influence upon exalted activity of the heart, *Veratrum* is of service in **palpitation** from temporarily increased functional power of the heart—the irritable heart of otherwise strong, vigorous men—the violent action induced by the use of tobacco in some cases inducing high arterial pressure and the palpitation of hypertrophy without valvular incompetence. It is likewise valuable in **aneurism**, restraining hyperactivity by reducing the vasomotor tonus. In these cases a dose of from three to four drops four times each a day will do better than the small and frequently repeated dose.

The use of *Veratrum* as an antispasmodic is very common with our practitioners. It may be given in **convulsions** with active cerebral hyperæmia. It is especially reliable as an emergency remedy in persistent cases of convulsions of childhood while the cause is being removed, its influence often assisting in the removal of the cause. From one drop to three or four may be given at a single dose, according to the age of the child, and repeated with caution.

In **puerperal convulsions** the mass of evidence in favor of *Veratrum* is overwhelming. One old physician reported in the *Medical Record* (1888) an experience in the treatment of an average of eight cases per year for twenty-eight years, without the loss of a patient, with *Veratrum* alone. Another treated twenty-three cases with *Veratrum*, with recovery in all. In these cases full doses are given, closely watching the effects on the stomach, if given per ore, and always watching its effects upon the heart. A dose of five drops can be repeated every half hour for three or four doses. At times five drops have been given every half hour for four or five hours.

In many severe cases with active cerebral engorgement as much as fifteen drops have been given hypodermically and repeated after a time.

Three drops of the tincture of *Veratrum* twice daily, gradually increasing the dose to twelve drops, then gradually reducing, may be given with care in a desperate case of **exophthalmic goitre** with excellent results.

The first investigators into the properties of *Veratrum* pronounced it an excellent alterative. It has not been generally used as such, but those who have so used it have expressed the strongest confidence in it. Dr. A. L. Clark, writing on the subject in 1889, said: "As an alterative, especially as an anti-syphilitic remedy, there is no better agent in the vegetable kingdom. Indeed, there is room for doubt whether the animal, vegetable or mineral kingdoms furnish a better remedy in purely syphilitic cases. If the patient has been already saturated with mercury, as is too often the case, doubtless the administration of some of the preparations of iodine will be a necessary adjuvant. In the uncomplicated secondary forms of the disease it will be seldom

that any other remedy will produce as satisfactory results as can be obtained with the Veratrum alone.

(Of a reliable fluid extract four or five drops three times a day will be usually well borne by the stomach, and the sensitiveness of that organ is my sole guide in dosage. If four drops disturb the stomach use three for a few days, then increase to four, then perhaps to five. Its smallness of bulk, not disagreeable taste, and, above all, its satisfactory effects, constitute strong recommendations for its use." Perhaps its power in this line increases its efficacy in the treatment of puerperal convulsions.

It is useful in **acute gonorrhœa**, preventing **chordee** and abating the activity of the symptoms. It is as useful also in orchitis from whatever cause.

It is a valuable application in localized inflammation, such as boil, carbuncle, felons, ulcers with heat and swelling, "cold sores" on the lips and inflamed pimples.

BRYONIA.

BRYONIA ALBA.

Synonym—Bryony.

Part Employed—The root.

Natural Order—Cucurbitaceæ.

Locality—Europe.

Botanical Description—*Bryonia alba* and *Bryonia dioica* are both climbing plants; the former indigenous to northern and the latter to southern Europe; leaves rough, cordate, five-lobed, toothed; flowers greenish-yellow, arranged in racemes; *Bryonia alba* has black, and *Bryonia dioica* red globular berries about the size of a pea; root one and a half to two feet long, two to four inches thick, spindle-shaped, somewhat branched, externally yellowish-gray, internally white, succulent, fleshy, transversely wrinkled; bark thin, brown lined, broad medullary rays and numerous small wood bundles arranged in circles and radiating lines, separated by broad cycles of parenchyma which shrinks in drying; taste bitter, acrid, disagreeable; solvents, alcohol, water. Dose from ten to sixty grains.

CONSTITUENTS—Bryonin, Starch, Gum, Sugar, Albumen, Wax, Fat and various Salts.

PREPARATIONS—*Tinctura Bryoniæ*, *Tincture of Bryonia*. Dose, from one to five minims.

Specific Bryonia. Dose, from one-tenth to two minims.

Physiological Action—In large doses *Bryonia* is an active hydragogue cathartic and sometimes causes inflammation of the stomach and bowels. In poisonous doses it causes a fall of temperature, dizziness, delirium, weak pulse, cold perspiration, dilated pupils and other evidences of a depressing action on the

nervous system. The recent root is highly irritant when locally applied, and capable of producing vesication.

Specific Symptomatology—In acute inflammations in the chest, with hard, quick pulse, short, quick, harsh, hacking cough, acute transient pains increased on inhalation, face flushed, especially the right cheek.

Frontal headache, or orbital or supra-orbital pain, with or without existing inflammation elsewhere; hemicrania, with occasional shooting pains through the head, increased on quick movement; soreness of the scalp; headaches of rheumatic origin.

Serous or synovial acute inflammation with quick, sharp pains, with or without exudation. The absorption of inflammatory products, either of a serous or sanguineous character, is greatly facilitated by this remedy. It opposes the breaking down of tissue and pus formation. Its influence upon inflammatory processes and upon the results of inflammation is even more positive in certain cases than aconite.

Therapy—Bryonia is a remedy of great value in the treatment of all acute inflammations of the thoracic viscera or of the pleura. In **pleuritis** its indications are usually all present. Uncomplicated cases will yield to this agent alone. Usually more rapid results will be accomplished by alternating it with aconite or with *asclepias tuberosa*. It must be continued if effusion be present. In **bronchitis**, with short, quick cough, with short, sharp pains, especially if the sputum be bloody or frothy, Bryonia acts directly. It should be given in small doses, at short intervals, and should be persisted in. It will subdue the pain and the cough promptly and exercise as marked an effect on the fever as any special sedative known. In **pneumonitis** it may be positively indicated.

If used in combination with other specific remedies, abatement of the symptoms will be even more rapid in these cases. Although opposed to complex medication, the author has used the following combination in these conditions in infants and children with the most happy results. The two prescriptions should be given as specified in alternation. In severe cases in small children, or during severe paroxysms, it is very desirable to give a yet smaller dose and alternate the remedies every twenty or thirty minutes:

R—Tinct. Aconiti,	-	-	-	-	℥v
Tinct. Belladonnæ,	-	-	-	-	℥viii
Aquæ Dest.,	-	-	-	-	℥ii

M. Sig. Half of a teaspoonful every hour, alternated with the following prescription every half hour:

R—Tinct. Bryoniæ,	-	-	-	-	℥viii
Tinct. Ipecacuanhæ	-	-	-	-	℥iv
Aquæ Dest.,	-	-	-	-	℥ii

M. Sig. Half teaspoonful every hour, alternated with the above as stated.

Auxiliary measures should be adopted as the character of the case suggests.

In **peritonitis** with quick, sharp pains, flushed face and anxious countenance, Bryonia is indicated. Auxiliary measures should not be neglected. This agent, in mild cases, will subdue all the inflammatory processes and control the pain most satisfactorily *without opium*.

During the early stages of any inflammation in which Bryonia seems to be indicated, aconite will facilitate its action and assist in the control of the processes, but Bryonia can be continued to most excellent advantage when the results of inflammation are extreme and weakness and prostration are present, when aconite would have a depressing effect and be contra-indicated.

In acute **pericarditis** and **endocarditis** the specific indications for this agent are often present, and its influence is prompt. It will be of great service if there is effusion with evidences of decreasing power of the heart. In acute **rheumatic inflammation** of the **heart** or pericardium it is one of the most direct remedies. Properly combined with indicated auxiliary measures, no remedy will act more satisfactorily.

It is thus of much value in typhoid conditions, especially in **typhoid pneumonia** or in **pleuro-pneumonia** or broncho-pneumonia with typhoid complications. In **typhoid fever** with severe enteric symptoms this agent is often of great service in restraining the retrograde processes and controlling excessive temperature. In **septic fevers** its influence will be marked and valuable. In septic peritonitis it may be given alternately with aconite.

Bryonia is indicated in **rheumatic fever** and in **acute rheumatic arthritis**. It must be given as in other acute conditions, in small doses frequently repeated. In muscular rheumatism and in rheumatic muscular pains it will accomplish good results if given in conjunction with *cimicifuga* or alternated with *cimicifuga* and aconite. In acute rheumatism of the joints of the fingers or hand it seems to be of especial value.

It is used in **inflammation** of the **liver** with its direct indications. In many cases of acute **jaundice** these indications will be found present, and its action will then be most salutary.

In **mastitis** or **orchitis** it is useful, and if the fever be high, the pains sharp and cutting and the face flushed, the influence will be prompt indeed. In these cases it is seldom given alone, but usually with aconite, *phytolacca decandra* or other direct remedy.

RHUS.

RHUS TOXICODENDRON.

Synonym—Rhus Radicans, Poison oak, Poison ivy.

Part Employed—The fresh leaves.

Natural Order—Anacardiæ.

Locality—North America.

Botanical Description—Rhus toxicodendron is an erect shrub, with which Rhus radicans is identical. They possess similar medicinal properties. Rhus toxicodendron is a shrub, one to three feet high; Rhus radicans is a climbing shrub thirty or forty feet long, attaching itself by rootlets to rocks and trees; bark brownish-gray; leaves ternate; on long petioles, lateral leaflets nearly sessile, four inches long, ovate, acuminate, smooth and shining above, downy beneath, margins entire or variously toothed and lobed, base rounded or wedge-shaped; flowers small, racemose, axillary, greenish-white, dioecious, subsessile panicles; fruit a roundish, smooth, dry pale-brown berry, containing one bony seed. Solvent, alcohol. Dose, from two to five grains.

CONSTITUENTS—Toxicodendric Acid, fixed Oil, Wax, Tannin, Mucilage.

PREPARATIONS—Specific Rhus tox. Dose, from one-twentieth to two minims.

In the preparation of the specific Rhus, the freshly gathered mature leaves are used. It is at first green in color, afterward light-brown or yellowish. It is volatile, and irritating to many. From two to ten drops in four ounces of water is the usual administration. A tincture of Rhus is prepared, but it varies according to its manufacture and the quality of the drug used, and is not reliable. Dose, from one-tenth to two minims.

Physiological Action—Most persons are poisoned by handling the poison oak and the several poisonous varieties of Rhus—Rhus toxicodendron or radicans, Rhus venenata and Rhus pumilium. It causes an erysipelatous inflammation of the skin, the swelling sometimes being so excessive as to obliterate the features, or the body may become so greatly swollen that the person is unable to move. Internally in poisonous doses of the berries it causes drowsiness, stupor, vomiting, convulsions, delirium, dilated pupils, hurried respiration, pulse at first full and strong, finally small, frequent, feeble. Poisoning by an infusion of the root causes a vesicular eruption, burning in the throat and œsophagus, dry, hoarse cough, nervous twitching and wandering of the mind, constriction of the temples, chilliness, nausea, thirst, debility, faintness and convulsions.

It relieves cerebral engorgement by increasing arterial tonus. In minute doses it acts as a cerebral sedative to the overworked and irritable brain and improves its tone and functional activity. It acts somewhat similarly to strychnia in that

it produces increased functional activity of terminal nerve filaments and is beneficial in some forms of paralysis.

Specific Symptomatology—In inflammatory fevers with sharp hard pulse; acute inflammation involving the skin, with bright circumscribed redness, extreme soreness or sharp burning pain; extreme redness of local parts inflamed, with great local heat and sharp pain; sharp supra-orbital pain, especially of the left orbit; burning in the eyes with flushed face; inflammation with constitutional impairment, evidenced by a sharp red tongue and deep red mucous membranes. The tongue has a pointed tip upon which the papillæ are elongated and pointed. In subacute or in chronic disease also with the above specific evidences, it is demanded.

The differential diagnostic points between *Rhus* and *bryonia*, are that *Rhus* is the remedy when the patient suffers most when warm and at rest, or when the distress is aggravated by heat, while *bryonia* is indicated when the distress is increased, by motion. One prominent homœopathic writer is authority for the statement that it has direct influence upon the tendons, sheaths of the nerves and fasciæ, hence its influence in rheumatism.

Therapy—The indications for this remedy are present in **acute erysipelas** to a marked degree, especially in erysipelas of the head and face, or that involving loose cellular tissue. If it be given in the first stages of this disease the symptoms abate rapidly. If typhoid symptoms be present in erysipelas it is an excellent agent, its influence being marked upon typhoid conditions. It is useful in **typhoid fever** and in typhoid conditions complicating acute inflammations. It seems to exercise the influence of a special sedative in these cases when *aconite* and *veratrum* are contraindicated. *Sordes* with dry red tongue and dry mucous membranes, flushed face, bright restless eyes, with tympanites, all demand *Rhus*. It soothes the **cerebral irritation** of typhoid, inducing rest and quiet, and controls delirium. It has antiseptic properties also which antagonize the disease processes within the blood. It prevents disintegration of the red blood corpuscles, and increases the vital powers.

In **scarlet fever**, **measles** and **smallpox** the indications for this agent are often conspicuous, and it will be found of first importance, especially if there be great injection of the conjunctiva, swelling of the palpebræ, extreme lachrymation and photophobia. In the latter stages of these diseases when the skin is livid, the tongue red, or red and glazed, with offensive breath, and offensive discharges, and with failing vitality, it is demanded.

In acute **inflammatory rheumatism** the indications for *Rhus* are conspicuous. The agent is often of first importance

in this disease. It may be alternated with aconite or other suggested remedy for the fever, or if there be deep muscular soreness with *cimicifuga*. Its value in all forms of rheumatism is great, and cannot be explained on the basis of its physiological action, as the homœopaths obtain excellent results from very minute doses. It is given in chronic rheumatism and to relieve the results of rheumatic inflammation.

In persistent dry, tickling **bronchial coughs** *Rhus* is a good remedy, whether they are acute or chronic. It is combined with or alternated with *bryonia* or *aconite* in capillary bronchitis with these characteristic coughs.

When **gastric or intestinal disorders** in children induce cerebral engorgement with great restlessness and flushed face, the specific tongue, mouth and mucous membrane indications being present, *Rhus* is the remedy. These cerebral symptoms may be induced by any inflammatory disease, and successfully cured with *Rhus*. In adults they are found in prolonged adynamic fevers, and often are a serious complication. *Rhus* will meet other prominent indications often while correcting the brain phenomena.

It has an **antispasmodic** influence, preventing **spasms** when induced by cerebral engorgement, or irritation which is of reflex origin or caused by gastric or intestinal irritation, the characteristic indications for the remedy being present. Webster says he values it more highly than *gelsemium* or *lobelia* in infantile convulsions.

In gastro-intestinal disturbances accompanying the inflammatory conditions over which *Rhus* has an especial influence, this agent is a direct sedative. It arrests nervous and reflex vomiting promptly, and vomiting from any cause when the tongue is pointed with reddened tip and edges. The so-called "strawberry tip" directly suggests *Rhus*. In acute abdominal pain, in **cholera morbus**, with extreme vomiting and spasmodic pain, this agent is valuable.

In local inflammations, induration and swelling tending to suppuration, as boils, felons and carbuncle, the indications point to this remedy, and given internally its influence is excellent. In ulcerations with red areas and red edges, in scrofulous indurations and ulcerations, it is useful. In eczematous and erythematous conditions it is of value. It is of service in parotitis and in inflammation of the sub-maxillary glands.

This agent must be used continually, and the prescriber must familiarize himself with all its side influences before he can fully appreciate its great value.

In pruritus of the vulva or other localities where there is erythema, with redness, persistent in some cases, especially with blonde children with eczematous tendencies, or children of a scrofulous diathesis, this agent is most prompt and valuable.

ANTIPYRIN.

Synonyms—Antipyrine, Phenazone, Phenyl-dimethyl-pyrazolon.

This agent is conceded to be the most important of the synthetic bodies. It was the first to thoroughly awaken the interest of the profession as a mass to the character of these chemical products.

Character—Its description is similar to that of phenacetin. It occurs as a colorless or whitish scaly crystalline powder without odor, but with a bitter taste. It is soluble in water, dilute alcohol and chloroform.

Administration—It is given often in doses of fifteen grains, repeated every two hours until three doses are given. The dosage varies from one grain in children to the maximum dose for adults of thirty grains.

It has been given hypodermically, but this method is abandoned as it produces local pain, abscess and increased depression. It is given per rectum and per vaginam for local pains with good results.

Physiological Action—When taken in toxic doses it produces a sensation of fullness in the head, with mild roaring and frontal headache. The face becomes pale, finally livid, then markedly cyanotic. There is great languor, tremblings, profuse sweating, precordial pain, fall of temperature, retarded respiration, with feeble rapid pulse. There may be a dullness increasing to stupor and ultimate coma with stertorous breathing. Profound collapse, with all of its phenomena, occurs in some cases. It has a direct action upon the skin, inducing in extreme cases dermatitis with œdema. There is often irritation of the skin, erythema or urticaria or an eruption resembling measles. The mucous membranes often share in the irritation. Sometimes the tongue and lips are much swollen and the lips are purple. It does not affect the character of the blood as phenacetine does.

In proper doses it does not irritate or disarrange the stomach or bowels. It is eliminated quite rapidly, appearing in the urine in some cases in less than an hour after its ingestion. It prevents excessive nitrogenous tissue waste within the body.

The dual influence of organic remedies is absent in the most of the coal tar derivatives. They do not slowly and steadily exercise their sedative influence from frequently repeated small doses, but must be given for their full physiological effect, and not having a natural adaptation to the organic functions they are erratic in their action.

All the depressing coal tar derivatives so reduce the power of the system to resist cold that the patients taking them feel the effects of the cold greatly, and if going out at once into the

cold air, suffer seriously from chill. If given near the approaching algid stage of malarial or intermittent fever, they will be likely to hasten the chill.

Therapy—When the agent was first introduced into France and in some other localities it was received with almost delirious excitement. It was believed to be an almost universal panacea. The contagion was conveyed to the masses of the people and great harm was caused by its indiscriminate, careless and ignorant administration. It was carried in almost every man's vest pocket, and was prescribed for imaginary as well as actual ailments. The reaction, when it came, was pronounced, but its actual pain-relieving properties saved it from annihilation, and have caused it to gravitate into its own narrow field of usefulness.

Specifically prescribed, Antipyrin **depresses the temperature** and by suspending nerve sensation **relieves pain**. It has been given in fever more generally than any other single remedy of its class, and almost as generally has been discarded as an antipyretic because of its erratic influence, and also because of the profound depression it causes. It is used more as a pain relieving agent at the present time. It produces sweating so profuse in some cases as to produce prostration.

It is unnecessary to detail all of the conditions in which it has been used. It is prescribed by physicians not familiar with the sure and safe action of the organic special sedatives, in the beginning stages of **sthenic fevers** and **inflammations**. When the sthenic stage has passed, its administration produces toxic symptoms, and the depressing effects which then appear must be combated with active stimulants. Unlike aconite or bryonia, if it controls the fever it does not correct the process of the disease present. It removes no cause of the disease.

If it did not produce prostration and extreme sweating it would be one of our greatest pain-relieving remedies. It is given in all forms of headache and neuralgia and in the pain of **rheumatism**, in which to a certain extent it relieves the general condition also; in **ovarian neuralgia** and **painful menstruation**, in **myalgia** and also in the **painful diseases of the spinal cord**.

In **surgical fever**, after reaction from shock has taken place, it allays pain and reduces the temperature.

It is given as an antispasmodic in **epilepsy**, in which case it is said to intensify the action of the bromides; also in **tetanus**, **convulsions** of all kinds, spasmodic **bronchial cough** and **spasmodic asthma**, **acute coryza**, **whooping cough**, and in **laryngismus stridulus**. It is advised in some cases of **chorea** and in irregular muscular action due to other conditions.

In its local influence it controls **passive hemorrhage**. It is used in the nasal cavities, in the mouth and in the vagina and

rectum. It is not given internally for its hemostatic influence. It acts locally only, by producing coagulation of the blood in and about the open vessels.

Toxicity—This agent is erratic in its influence, producing toxic effects in some cases out of all proportion to the smallness of the dose, and in other cases producing but mild effects in enormous doses. It is by no means steady, exact or reliable.

The symptoms of poisoning may also be out of proportion to the amount of the danger, as they are usually combated promptly, and quickly overcome by nerve stimulants and heat. Alcoholic stimulants and strychnia are the most available antidotes.

ACETANILID.

Synonyms—Antifebrin, Antifebrine.

The name Acetanilid is the true chemical name. The name Antifebrin is proprietary, and if designated in a prescription demands the product of a single manufacturer.

Occurrence—The agent bears a close analogy to phenacetine. It is formed by combining pure aniline and glacial acetic acid and retaining them at the boiling point for four hours. (U. S. P.)

Character—It is a finely crystalline permanent neutral body in the form of a bitter, white powder. It is soluble in eighteen parts of boiling water and in two hundred parts of cold water. Quite freely soluble in alcohol and chloroform, less so in ether.

Physiological Action—In narrating the physiological action of this agent we would repeat the phenomena observed in the action of antipyrine almost in exact detail. There are some slight unimportant variations. It does not act to any great extent directly upon the circulatory apparatus, and yet in its direct influence it so inhibits the heat production and increases the radiation and diffusion of the heat, that the rapidly lowering temperature causes a reduction or depression of the heart's action and a slowing of the respiration.

There is sudden collapse in overdoses, as with antipyrine, but this is due to paralysis of the vasomotor system and the result is a marked decline in blood pressure.

Upon the blood it acts in a manner similar to phenacetine in inducing the formation of methæmoglobin and destroying the oxygen-carrying power of the blood. It destroys the red corpuscles to a certain extent, as its continued use induces a peculiar pallor more permanent than that caused by the temporary influence of the agent upon the capillaries in cyanosis. The blood assumes a darker color and the urine becomes dark-brown in color and contains free hæmoglobin.

Its prolonged use will induce other important organic

changes. The red-blood corpuscles slowly decrease, and local congestion, blood stasis and functional inactivity of the kidneys and liver follow, with albuminous urine containing blood debris, and in some extreme cases heart clots are subsequently found.

It is the belief of the majority of the profession that fewer accidents occur after the use of this agent than from antipyrin. It is a rather more manageable remedy although possessed of most of the erratic and unaccountable properties of the other agent.

Administration—As compared in its therapeutic application, doses of five grains produce the results of fifteen grains of antipyrin. A single dose of five grains has produced alarming cyanosis. It is used at the present time, however, probably as much or more than the sister remedy, as it may be given in a small dose and repeated a number of times if watched, with no bad results.

Therapy—It will depress the temperature in all **fevers**, but the results of the depression are often more serious than those of the fever.

If given in asthenic or persistent fever, or to reduce the temperature of phthisis pulmonalis, a very small dose produces cyanosis and a large dose greatly increases the prostration.

It is often given in the initial stages of sthenic fever, and it is claimed to abort many cases. If a single full dose be given in the developing stage of **la grippe**, that complex malady may be warded off completely, or its apparent progress after a few hours may be safely met in strong patients, with another full dose with only good results. It has often been given in the development of this malady in small doses repeated every two hours through its earlier stages; but full doses, confinement of the patient to a hot room, a hot pediluvium and a copious sweat will abort most cases.

It is exceedingly useful at the onset of **acute articular rheumatism**. It allays the pain promptly, and the fever is held in abeyance. If given in this complaint with aconite, cimicifuga and applied moist heat, its pain relieving properties are exhibited promptly and to a satisfactory advantage.

It is also given in **sub-acute** and **chronic rheumatism** to relieve pain and in the many forms of muscular rheumatism. In **lumbago** it is curative, and **sciatica** of a recent character will yield to its influence. It is a more manageable remedy in headaches than antipyrine, and is in common use among the laity for all aches and pains about the face and head, and for **neuralgia** wherever located.

It is quite common practice to combine this agent with a small dose of the citrated caffeine and with bicarbonate of sodium. In this combination it is claimed that its pain-reliev-

ing properties are greatly enhanced and that its depressing influence is reduced to a minimum. The popular proprietary analgesic known as **Antikamnia** is asserted to be so constructed. We have no certain knowledge of its composition. Its influence as a pain reliever is certainly next to morphine of all the agents we possess, and almost no serious results have yet obtained from its use when given in repeated doses even of ten grains. It is especially valuable during the progress of inflammations, and given in pleuritis or peritonitis it certainly abates the inflammatory condition, relieves the pain at once, and the diffused soreness shortly, as satisfactorily as opium, and it does not derange the stomach or lock up the secretions. It is of value in pain of a non-inflammatory character, and is a convenient and satisfactory remedy in headaches without regard to cause, if the cerebral circulation be full. It should not be prescribed in anæmic headaches.

PHENACETIN.

Synonyms—Phenacetine, Para-acetamidophenetol.

Occurrence—This phenol derivative is a complex chemical body, obtained by acting upon para phenetidin with glacial acetic acid.

Character—It is crystalline, occurring in scales of a colorless, tasteless and odorless character. It is not soluble to any extent in cold water, but dissolves, one part to seventy, in boiling water and one part to sixteen in alcohol.

Physiological Action—The agent in large doses upon the lower animals produces cyanosis, rapid respiration, irregular gait, vomiting and stupor. Twenty-two grains produced cyanosis and collapse in a woman, but very few cases of toxicity are reported, and none that were fatal. It induces the formation of methæmoglobin in the blood. It slows the heart and reduces the temperature gradually, not with the abruptness and violence of the other agents of this class, and its influence is most permanent. It apparently acts upon the thermogenetic centers in reducing the temperature, rather than by inhibiting the radiation of heat. It increases the power of the heart and the blood pressure to a slight degree, at first.

Therapy—It is without doubt the safest and most reliable of its class. It produces sedation in **fevers**. The reduction of the temperature is usually pronounced. This occurs within an hour, and continues from six to eight hours if a sufficient dose be given. It gives relief from **pain** and induces perspiration. Its power in relieving severe pain is not great, but it is valuable indeed in relieving **distress** and **minor pains** during the course of fever and inflammatory disease, conducing to the comfort

of the patient. It unlocks all of the secretions, producing a moist tongue, soft skin and soft full pulse. Cyanosis is seldom induced by it. If its action be well understood it can be made to work in harmony with aconite, gelsemium or bryonia in the treatment of the earlier stages of severe fever. It is as depressing as they are, and must be withheld when the fever is on the decline. Like other coal-tar antipyretics, given alone it fails to accomplish what the organic agents accomplish in early fevers. The influence they exercise is steady, uniform and permanent, acting in perfect harmony with natural forces in overcoming the fever. The reaction after the depression of temperature induced by the synthetic remedies often induces a higher temperature than the original. There is no perceptible reaction with the organic sedatives.

Phenacetin, given for a time in small doses in alternation with these remedies, enhances their power to increase secretion and **relieve distress**. It cannot and need not be long continued. A few small doses usually suffice. In some cases a single full dose is sufficient. It will prepare the system during fevers of a remittent character for the reception of quinine during the remission. This checks the course of the fever and preserves the vital tone of the patient.

The pain of acute inflammation is quickly relieved in many repeated cases by this agent. It does not influence the process of the inflammatory action as aconite or bryonia does, but it prevents for a time the shock of pain upon the nervous system, and the destructive effects of the high temperature upon the blood.

This agent acts more upon the central nervous system, than do other coal-tar analgesics. It has quite a marked antispasmodic influence. It is advised in convulsions of all kinds and in hysterical paroxysms if there is no great degree of depression.

EXALGIN.

Synonym—Methylacetanilid.

Character—This derivative of the methyl group occurs in long needle-shaped or tablet-like crystals according to the manner in which the crystallization takes place. It is soluble in hot water, sparingly so in cold water and readily dissolves in very dilute alcohol.

Physiological Action—Brigonnnet, who discovered the substance, is responsible for the statement that in its physiological influence upon lower animals it produces a fall of temperature, depressed and irregular respiration, and cyanosis with alternations in the character and color of the blood, which becomes darkened. It has produced salivation also.

In cases where toxic effects were produced, oppression of

the heart's action amounting almost to failure, and palpitation and cyanosis were produced; also vertigo, dyspnœa, tinnitus aurium, headache, drowsiness, amblyopia and dilated pupils. In a very few cases there have been convulsions.

It seems to work with the least untoward effects in children, and the results are more satisfactory. With these patients the initial dose should vary from one-sixth of a grain to one grain and should be slowly increased. There are but few children of ten years who can take repeated doses of two grains without cyanosis. A safe dose to repeat for a six year old child is one grain. Three grains once repeated produced almost fatal symptoms in a fourteen year old boy.

Therapy—This agent is valuable in its influence over **pain**, but is not an active or safe antipyretic. It controls pain of nervous character and influences irregular nervous action and irregular muscular movements. In this condition more satisfactory results will probably be obtained from repeated small doses rather than from single large doses. It affects the circulation of the brain and spinal cord in much the same manner as *cimicifuga*. It is specific to one condition; in **chorea** of recent character, in children, it will supersede many agents known at the present time. The irregular movements are influenced after every dose, and the ability to sleep without the muscular movements is apparent from the first.

It seems to add some strength and tonicity to the brain and to encourage its nutrition. The headache sometimes present in these cases and the wandering pains and general discomfort are relieved by it. All other perverted conditions, such as impaired digestion and assimilation, anæmia, causes of local irritation, etc., must be relieved by the proper tonics and restoratives, and rest must be enforced.

The agent has been used in headaches of nervous origin, in hemicrania, and insomnia from nervous irritation, and in melancholia with nervous irritation and excitability.

In the lightning pains of tabes, in angina pectoris, in sciatica, and in various rheumatic conditions, the agent has been found useful. It has considerable power in the control of pains of the character mentioned, but its depressing influence must be closely watched and guarded against.

Comparative Symptomatology of Antipyretics.

Gelsemium—Fever with nervous phenomena—nervous excitability, restlessness, flushed face, bright eyes, contracted pupils, sharp, quick pulse, nervous twitchings, evidences of acute determination of blood to the brain.

Aconite—Sthenic fever with sharp, hard, quick pulse, dry, hot or burning skin, chilliness up and down the spinal column, suppressed secretions; at the onset of acute fevers; in the early

stages of acute inflammations; in the developing stages of the exanthematous fevers.

Veratrum—Sthenic fever with large, full, bounding, fast pulse, with high temperature, engorged capillary circulation; at the onset of acute local inflammation, in previously strong patients; in acute convulsions with high temperature and rapid pulse.

Bryonia—In the fever of acute inflammation; if in the lungs or bronchi there is sharp, hard, short, quick cough, inducing pain and soreness, quick pulse; if in serous membranes there is quick, acute pains, diffused soreness and tendency to effusion. Acute synovitis, with pain on movement and threatened exudation, is relieved by it.

Rhus Toxicodendron—Acute inflammatory fever with sharp, hard pulse; involvement of the skin, bright, circumscribed redness, with burning pain and extreme soreness; fever with sharp supra-orbital pain, burning in the eyes, flushed face, red mucous membranes, dry tongue with reddened tip and edges, red, narrow, elongated tongue with brown coat; sordes.

Antipyrin—The onset of sthenic fever in strong patients; symptoms similar to veratrum, but accompanied with general distress or much pain. Not used after the developing stage.

Acetanilid—Acute fever with marked nervous phenomena and much pain; nervous excitement with acute neuralgia or rheumatic pains; development of la grippe.

Phenacetin—In acute high fevers with hot, dry skin and suppressed secretions and general discomfort, especially from acute cold; in developing inflammation before structural change has occurred. The most desirable of the synthetics.

There is but little distinction in the symptomatology of the last three remedies.

Belladonna—Must be studied with reference to its influence in the developing stage of inflammations. It will be found classed with nerve stimulants. It is a *most important specific remedy* in equalizing the circulation and preventing the local hyperæmia essential to all local inflammatory action. It is especially indicated when there is fever with dullness or tendency to stupor, with dull eyes and dilated pupils. It works in perfect harmony with aconite or bryonia. It is not a sedative to the fever, but combats the fever processes. It is given usually with a direct fever remedy.

Asthenic or Adynamic Fevers.

It will be observed in the study of the above remedies as applicable to the reduction of fevers, that with the exception of one or two they are to be prescribed only in *sthenic fever*—in which there is an apparent temporary exaltation of vital force—in which the inherent dynamic influences have unwarranted exercise. Where temporarily, the nervous and vital powers have

reacted above or beyond physiological limits, the agents are prescribed to exercise a restraining or inhibiting influence upon the fever, by a sedative or depressing influence upon the nervous system or upon the heart and circulatory apparatus. They depress vital force.

In many cases fever exists where the vital forces are already depressed or exhausted to a greater or less extent, and where there is extreme feebleness. In such a case depressants of vital force are contra-indicated.

In these *asthenic* or *adynamic* conditions, it is as necessary that the fever be controlled as in *sthenic* cases, but a class of remedies must be used which stimulate, encourage or increase the vital forces, in direct opposition to the action of those advised in *sthenic* cases.

The conditions in which *adynamia* with exalted temperature is apt to prevail, are in the later stages of typhus and typhoid fevers, in protracted fevers of any kind where there has been a great draft upon the vital forces, in the progress of severe inflammation which has resulted in the breaking down of structure and the deposit of inflammatory products, and in tubercular or other cachexia. While the vital forces must be nourished, supported and encouraged toward ultimate restoration, measures must be used also, which will restrain the temperature, if possible, at the same time. We have a limited number of remedies that act specifically for this purpose, and they cannot be placed in a distinct class. This influence of these agents will be found fully considered in the class in which the agent is placed because of a wider influence. They will be found classed usually as nerve or heart stimulants.

Bryonia and **Rhus** of the previous class have a most important place in these fevers, as has been specified. One of the best, if not the best of the remedies for this purpose is **Cactus Grand.** which will be found among the specific heart tonics. **Digitalis** is excellent for this purpose, although while it sustains the heart through the progress of the fever, it does not, to so great an extent as cactus, cause a reduction of the temperature. **Strophanthus** acts much the same as digitalis. **Anhalonium** is said to possess this power, but it has not as yet been widely used. Other agents will be mentioned as we progress.

One of the safest measures is the abstraction of heat by the use of water. This is fully considered in the closing chapters of this book. The temperature of the water is lowered in proportion as the vital force is able to react under it.

Judicious nutrition and perfect elimination are essential considerations in the treatment of *adynamic* fevers.

Note—The study of this first class of remedies has proven the statement previously made, that it is impossible as yet to arbitrarily classify our agents. It will be seen that, while these

agents used in the control of fevers are nerve sedatives, they are also antispasmodics to a marked degree in some cases, hypnotics, analgesics, diaphoretics, diuretics or alteratives. In each of the following classes the same fact will be found true. We have endeavored to classify the remedies as they are most commonly used, but each must be studied without regard to class in the entire field of its action, especially as indicated by its specific symptomatology.

CHAPTER II.

AGENTS COMMONLY USED IN THE CONTROL OF PAIN — ANODYNES, ANALGESICS.

OPIUM.	SALTS OF MORPHINE.	CONIUM MACULATUM.
MORPHINE.	CODEINE.	CANNABIS INDICA.

OPIUM.

PAPAVER SOMNIFERUM.

Opium is the concrete milky exudation obtained by incising the unripe capsules of the white poppy of Asia Minor.

Natural Order—Papaveraceæ.

Locality—Asia Minor, Persia, India, Africa, China, Egypt, Greece, Italy, England and United States.

Botanical Description—The white poppy is annual, stem smooth, nearly round, glaucous, erect, branching, leafy, two to five feet high; leaves six to eight inches long, amplexicaul, sessile, divided into many segments, repand, green, midrib wide, veins prominent, flowers terminal, three to seven inches wide, color white or silver-gray, calix smooth with two sepals; fruit capsule smooth, nearly globular, three or four to each plant, one to three inches wide, the pericarp dehiscing through pores beneath the lobes of the stigma; seeds white, reniform; root white and tapering.

CONSTITUENTS—Morphine, Codeine, Thebaine, Pseudo morphine, Narcine, Narcotine, Papaverine and twelve other alkaloids combined with Narceinic acid.

PREPARATIONS—Opium Pulvis, Powdered Opium. Dose, one-half to two grains.

Tinctura Opii, Tincture of Opium. Dose, five to twenty minims.

Tinctura Opii Deodorati, Tincture of Deodorized Opium. Dose, five to twenty minims.

Tinctura Opii Camphorata, Camphorated Tincture of Opium (Paregoric.) Dose, from one-fourth to two drachms.

Pulvis Ipecac uanhæ et Opii, Powder of Ipecac and Opium. (Dover's Powder.) Dose, five to ten grains.

Pulvis Ipecacuanhæ et Opii Compositus, Compound Powder of Ipecac and Opium. (Beach's Diaphoretic Powder.) Dose, three to five grains.

Morphinæ Sulphas. Dose, one-eighth to one-fourth grain.

Pulvis Morphinæ Compositus, Compound Powder of Morphine. (Tully's Powder.) Dose, five to ten grains.

MORPHINE.

A white or colorless crystalline body in shining prismatic crystals; soluble in thirty-six parts of hot alcohol, and in alkalies; almost insoluble in water. But little used in medicine.

Dose, from one-eighth to one-fourth of a grain.

The following salts are in common use:

Morphine Acetate.

A yellowish-white crystalline body, or an amorphous powder, bitter, inodorous except a slight odor of the acetic acid; soluble in two and one-half parts of water. Dose, from one-twentieth to one-half of a grain.

Morphine Sulphate.

In white feathery, silky crystals, without odor; of an intensely bitter taste; soluble in twenty-one parts of water and in seven hundred parts of alcohol. Dose, one-tenth to one-fourth of a grain.

Morphine Hydrochlorate.

Muriate of Morphine occurs in white needle-shaped, feathery, lustrous crystals; bitter and odorless; soluble in twenty-four parts of water and in sixty-two parts of alcohol. Dose, from one-twentieth to one-half of a grain.

Apomorphine Hydrochlorate.

This is the product of the action of hydrochloric acid on a modified form of the alkaloid morphine. It may also be obtained from codeine. It occurs as white or grayish white crystals, without odor, bitter, turning slightly green upon exposure to the air; soluble in forty-five parts of either water or of alcohol. If it produces an emerald-green tint in solution in water it must be rejected. It may become changed in character and dangerous. Solutions must be freshly made.

Therapy—This agent is used only as an emetic; usually hypodermically. The dose is from one-twentieth to one-sixteenth of a grain, although one-eighth of a grain may be given. It is not safe in any dose with children. It may be given to eject bodies from the œsophagus, to evacuate the stomach after the

ingestion of poisons, and in extreme catarrhal or asthmatic attacks. It is a constituent of some of the cures for the alcoholic habit.

Codeine.

Occurrence—An alkaloid of opium closely related to morphine, often containing a certain proportion of morphine if not carefully prepared.

Character—White octahedral crystals, bitter, odorless, permanent, soluble in eighty parts of water and in three parts of alcohol. Dose of Codeine, from one-fourth to two grains.

Physiological Action—Its influence is that of an anodyne and antispasmodic, more active as an antispasmodic than morphine and much less narcotic. It controls pain without checking secretion to as great an extent as the other alkaloids of opium.

Therapy—It has a more marked influence upon **pain** in the **abdomen** and in the **pelvic organs**. Spasm, neuralgia and other painful conditions in these parts are well controlled by Codeine. **Cramp colic** and spasmodic dysmenorrhœa yield readily to its influence. It is advised in **diabetes mellitus** to control the excretion of sugar. It has been given in doses of fifteen or twenty grains daily for this purpose, in some cases with permanent results.

Codeine has a marked influence upon **spasmodic cough**. It is often given to soothe irritable conditions of the air passages and to control persistent annoying and exhausting cough.

Physiological Action—The action of opium, and of morphine and its narcotic salts, is the same. Opium is stimulant and narcotic, according to the dose and susceptibility of the patient. Infants and old people are easily poisoned by the drug, while those addicted to alcohol can take very large doses without any bad effects; and those accustomed to the drug can take a poisonous dose with impunity.

In the healthy adult a moderate dose of opium stimulates all the nervous functions of the body, raises the spirits and excites intellectual action; this gives way to a condition of placidity, freedom from care, and a state of quiet enjoyment. In an hour or less consciousness is lost in sleep, which may continue for eight hours or longer. On waking there is evidence of disturbance of the functions of the organism, such as nausea, vomiting, headache, constipation and diminished secretion, except that of the skin.

In a dose sufficient to cause death the period of excitement is short, while the strength of the system rapidly gives way to drowsiness and apoplectic sleep. There is stertorous breathing, dusky countenance, slow pulse, nearly total insensibility, only responding slightly to violent agitation, with confusion of the

mind, and an inclination to continue in a comatose state with increasing debility. After a few hours, six to twelve, according to the dose and the resisting power of the patient, the face becomes pale, the pulse from being full and strong becomes weak and thready, with cold extremities, a cool and clammy skin, a slow gasping respiration; a condition from which it is impossible to rouse the patient and death soon follows.

The pulse is first slow from stimulation of the vasomotor nerve centers, and becomes rapid as these become paralyzed. The pupil is first contracted by stimulation of the oculo-motor nerves, and dilates as death approaches and these become paralyzed. Death results from paralysis of respiration.

With some individuals there appears to be an inherent and usually permanent idiosyncrasy against the action of opium and morphine. An exceedingly minute dose with such, will produce unpleasant symptoms. These are nausea or violent vomiting, spasm of the stomach and loss of appetite, obstinate constipation or abdominal pain. In others there is nervous excitement, restlessness headache, tremors, general distress and an increase of pain. With others it produces extreme wakefulness instead of restful sleep. In some there is diarrhoea instead of constipation. Given under the conditions we have named as contraindications, it will often produce these phenomena; where there is an absence of idiosyncrasy, and where given under proper conditions, the effects would be desirable.

Itching of the skin, inducing an apparent miliary eruption, is one of the unpleasant effects of its use, which, like any one of the others, may be always greatly exaggerated in certain individuals.

By using water as a solvent, or combining Opium with ipecac or camphor, or in some cases with the bromides, these unpleasant effects can, in great measure, be overcome.

Its application to open wounds in childhood has produced marked narcotic effects. It has poisoned infants while nursing, the mother either taking it as medicine or habitually.

Caution—All of the effects of the agent are especially marked in infants and early childhood. The nervous system is profoundly impressed by it, and the dose, if it is given at all to very young babes, should be infinitesimal.

Its administration can be avoided in nearly all cases with these little patients, as we have access to many agents which, while not working actively in adults, produce most satisfactorily soothing, anodyne or pain-relieving properties in childhood.

Opium addiction is acquired by continued use of the agent, and is debasing and deadly in its effects.

Another serious objection to its administration in large doses often is that it conceals or obscures the actual condition, the diagnostic symptoms or the specific disease indications, and per-

mits disease to advance to formidable proportions before its real character is known. This is true of appendicitis and other purulent inflammatory conditions.

This agent is so convenient and produces such immediate effects that it is often used by the indolent physician when other agents would produce better after results, and would more speedily promote a permanent cure. It is, therefore, proper to caution the young physician against depending upon it to too great an extent, and to urge him to study well all other agents acting synergistically, as when his knowledge of the other agents permits him to choose between them and this he will prefer them. He may thus be able to select an agent with a single direct influence, where, with the administration of this, he has undesirable side influences to overcome with the treatment of the other conditions.

Administration—Opium may be administered by the mouth, by the rectum or vagina, by the hypodermic injection of its alkaloids, by application to a portion of the surface of the body after removal of the cuticle, by inhalation or by insufflation.

Where there is a temporarily apparent contra-indication for its use, the aqueous extract or the deodorized tincture (aqueous) or other aqueous preparations may be used, as water does not dissolve the narcotine, which is believed to be the irritating and depressing principle of the alkaloids.

Or it may be given in conjunction with some agent which will overcome the antagonizing conditions. The acidity of the stomach may be neutralized by an agreeable alkaline aperient. The inactive secretions may be partially re-established by pilocarpine or jaborandi, or the bromides may be given in conjunction to soothe the nervous system, or ergot to unload the brain of an excess of blood.

The hypodermic use of morphia is demanded and is justifiable where great pain is present. In these cases the size of the dose must be determined by the circumstances. Its influence is prompt and satisfactory.

This method is preferable because the chemical influences of the gastric secretions upon the salt are avoided.

Veterinarians find it necessary to always administer morphine in this manner, as often no desirable effects are produced if brought in contact with the stomach and intestinal secretions.

Specific Symptomatology—When Opium is given carelessly or promiscuously, unfavorable results may occur. The conditions under which the administration of Opium or its narcotic salts are admissible are as follows: There is pain without cerebral engorgement; there is an absence of flushed face, but not pallor; there is a relaxed, cool and perhaps moist skin; the tongue is moist and the pupils are not contracted.

Extreme wakefulness or restlessness, painful, spasmodic condi-

tions, excessive passive discharges of whatever character and local inflammations with the above conditions all indicate the use of the agent.

Pain is the great and primary indication for Opium. The agent can often be substituted in mild cases, and with children, and the causes of pain can often be removed by other agents; but severe, persistent, racking pain has no other antidote except anæsthesia.

Contra-Indications—In its primary influence it is a brain and nerve stimulant. It is, therefore, contra-indicated where there is an irritated and overstimulated nervous system, with flushed face, bright eyes with contracted pupils, dry, hot skin, dry, coated tongue and inactivity of the excretory functions. Administered under these circumstances, it will increase the restlessness and induce general distress and painful wakefulness.

Therapy—In sudden **acute pain**, in pain from wounds or injury, or from burns, the contra-indications are seldom present, and morphine can be administered usually hypodermically.

Pain, like a persistent high temperature, will in time produce serious impressions upon the system which, in themselves, will be hard to overcome. When pain is not extreme equally good results, however, can be obtained in many cases from smaller doses of this agent, as from larger ones, with much less impression upon excretion. In the successful and highly satisfactory treatment of **peritonitis, appendicitis, pleuritis, ovaritis** or **metritis** during the past fifteen years the author has adopted the uniform method of giving the indicated remedies as indicated, and for general or local soreness or tenderness increased on pressure or on movement of the bed or clothes, he frequently gives from two to five drops of the deodorized tincture of Opium every two hours; seldom more. This will answer equally well if there is occasional quick, sharp, darting or shooting pains, with the soreness, if heat be applied. In twelve hours the distress is relieved, and in twenty-four hours the patient is in every way improved. This is accomplished without producing dullness, drowsiness or undue sleep, or without locking up the secretions and excretions, in fact without exhibiting but few if any of the physiological influences of the remedy.

Where distress or wakefulness is present, and of such a character that morphia is directly indicated, a small dose often repeated in the stomach will sometimes do better than large doses. In these cases, if half a grain be dissolved in two ounces of water, and a teaspoonful be given every fifteen minutes, the patient will soon become soothed and quiet and will sleep naturally without knowing what has induced it; a much smaller quantity than is usually given, being found necessary.

It reduces congestion and engorgement of serous membranes most rapidly, and is thus specific in the above-named inflammatory conditions, when small, sharp, stabbing pains and diffused tenderness are the leading symptoms.

It has an especial action on mucous surfaces. Its influence tends to reduce excessive activity or hyper-secretion. It is for this latter effect that it is useful in **catarrhs** of all characters, in **diarrhœas** and excessive activity of all secreting organs.

It controls irritation of the peripheral nerves in the intestinal canal, and thus arrests **diarrhœa** and controls undue peristaltic action, which in these cases is often necessary. In **surgical diseases** of the intestinal canal and after operations this effect is quickly and essentially obtained.

Opium is a most desirable **diaphoretic**. It promotes excretion from the skin to a marked degree, exercising this function often, while it locks up the intestinal and renal secretions. It is often given in combination with a relaxant or an emetic for this purpose, and is officinal in combination with camphor and ipecac, as Dover's powder. It is or it may be combined with powdered *asclepias tuberosa* with happy results.

It is common practice to use Opium or Morphia in solution for **eye washes**—collyria. It is serviceable in many cases.

Opium and its alkaloids are powerful **antispasmodics**, and are of general use in local spasm and in convulsion. Specifically, it is useful in colic from **biliary** or **renal calculi**, in **uterine** and **ovarian colic** and in the **pains of labor**, properly adapted; in **lumbago**, **sciatica**, **angina pectoris**, **gastrodynia** **pleurodynia** and other forms of neuralgia.

In **puerperal convulsions** Morphia, hypodermically, is by some considered a most superior agent, although those familiar with veratrum prefer the latter agent in most cases. The dose of Morphine must be large and must be repeated if needed.

Many physicians use Opium to control **passive hemorrhage**, hemorrhages from the kidneys and womb, from the lungs and bronchi, and from the stomach, and from the bowels in typhoid.

It may, however, usually be dispensed with in these cases, as it is not desirable to lock up the natural secretions of these organs, a common result from the use of this agent.

It was advised by Pavy as an important agent in the treatment of **diabetes**, to control all unpleasant conditions, especially the elimination of sugar and the extreme thirst. Its influence is not permanent, and it does not cure.

It is used also in **spermatorrhœa**, and will temporarily reduce sexual erethism and unload the organs of blood and restrain abnormal losses and discharges, but it is not usually curative and cannot be persisted in without injury.

For **gonorrhœal** injections and as bladder washes and in

leucorrhœa, it is incorporated in liniments and is used as a cataphor.

In the form also of **suppositoria**, introduced into the rectum or vagina, it is useful for painful conditions in the rectum and lower bowel, and in painful pelvic disorders.

It is also applicable in this manner to painful kidney and certain bladder troubles, in stone and gravel, and in obstinate vomiting.

Immediate relief to the tenesmus of **dysentery** is accomplished by the injection of a few drops of a liquid extract of opium in two ounces of a solution of starch, following the bowel movement.

In China, India, Persia and Turkey, in Mohammedan and Hindoo countries, where their religion prohibits the use of alcoholic intoxicants, opium is smoked more generally than our own people use tobacco and alcohol. Its effects are fearful. To this may doubtless be ascribed much of the intellectual inactivity, the moral debasement and the lack of advancement of the civilization of those countries.

Toxicity—Opium has been used as much if not more than any other agent for suicidal or homicidal purposes. It is certainly a desirable agent for suicide if one desires a comfortable and painless death. It is also acceptable when euthanasia is desired.

Antidotes—It is antidoted by extreme heat, physical activity, increased nerve action and stimulation. Active mechanical emetics or the stomach pump should be used to evacuate the stomach. These are mustard in warm water, ipecac, lobelia in single full doses, or sulphate of zinc. The direct antagonists are atropia in small doses hypodermically in the early stages of its toxication, strong coffee, or caffeine hypodermically in large doses—two to five grains, strychnia hypodermically and nitro-glycerine, alcohol, ammonium and digitalis. Potassium permanganate will neutralize the poisonous properties of Morphine. The patient is kept moving, flagellation and electricity and in extreme cases artificial respiration.

CONIUM.

CONIUM MACULATUM.

Synonyms—Poison Hemlock, Poison Parsley.

Part Employed—The full-grown fruit, gathered while green.

Natural Order—Umbelliferae.

Locality—Europe, Asia, Northern Africa.

Botanical Origin—Conium Maculatum is biennial; the stem is from three to six feet high, erect, herbaceous, round, furrowed, hollow, smooth, green, shining, with dull purple spots; leaves tripinnate, a foot long, green, with long petioles; leaflets ovate, lanceolate, pennated, incised, dentate, mucronate, glossy beneath grayish-green; flowers small, in small umbels, ten

or twelve rayed, seeds one-eighth inch long, oval, compressed, with two mericarps and five cernate ribs on the face of each, separated by slightly wrinkled furrows, no oil tubes; solvent, alcohol. Dose, one-fifth grain.

CONSTITUENTS—A volatile alkaloid Conine, Conhydrine, Methylecine, Pseudo-Conhydrine.

PREPARATIONS—Extractum Conii, Extract of Conium. Dose, one-half grain.

Extractum Conii Fluidum, Fluid Extract of Conium. Dose, two to six minims.

Expressed juice of the fresh plant preserved with alcohol. Dose, three minims.

Specific Conium. Dose, one to five minims.

Physiological Action—When given in a sufficient dose, Conium causes complete relaxation of the whole muscular system; the eyes close, the movements of the eyeballs are sluggish, mastication and swallowing are difficult, speech is slow and maintained by an effort, the voice is hoarse, while the heart and intelligence are not disturbed. In a fatal dose, the lower limbs become paralyzed, the effect gradually ascending to the upper part of the body, intelligence being retained to the last.

Administration—If the characteristic odor of this substance is absent, the probabilities are that it is devoid of value, as it is the volatile principle which possesses the odor, and it is that upon which its value as a therapeutic agent depends to a great extent. Care must be taken in diluting fluid preparations as they are apt to precipitate. Fresh preparations only, diluted when administered, are reliable.

Specific Symptomatology—The agent relieves the **pain of cancers and ulcers**. In this it is of specific value. It is of much importance in **ulceration of the stomach** either acute or chronic, and in incipient **gastric cancer**. It will soothe the pain more efficiently than other apparently more powerful agents. It must be given in large doses; as much as fifteen minims of the fluid extract are sometimes needed. Large doses must be carefully watched. It relieves distress in the glandular organs and in glandular enlargements, when there is a scrofulous or cancerous cachexia, dull aching pains not usually acute, not sharp cutting pains. In the pain of cancer of the pelvic organs or of the mammæ it gives relief, and, indeed, it gives relief to pain in the pelvic organs whatever the cause or character.

Therapy—The anodyne and antispasmodic soothing properties of the agent suggest its use in spasmodic affections and irregular muscular movements—movements attended by extreme activity of the motor nerves. In **paralysis agitans**, in **chorea** and in **hysteria**, in **delirium tremens** and **acute**

mania it is thus advised. Its use in **trismus**, **laryngeal spasm**, in irregular muscular twitchings and spasmodic **wry neck**, will be attended with excellent results. In profound **spasm**, as in convulsions, epilepsy and tetanus, while of some benefit it is of no marked value and more potent agents are prescribed. In its administration, hypodermic injections of **hydrobromate of conine** are sometimes much more prompt and satisfactory in their action.

Conium is useful in many kinds of cough and inflammatory diseases of the chest. In **whooping cough** and in many other spasmodic coughs it is of much service. It is useful in **asthma** and difficult breathing of **emphysema**. It may be used internally or the ointment may be applied over the chest.

It is valuable in **laryngitis** and in dry irritable bronchial coughs and in phthisis. In all such coughs the vapor inhaled from the fluid extract or juice dropped on the surface of hot water, in a rather close-mouthed vessel, is sometimes of marked benefit. In the pains of **chronic hepatitis** Conium is excellent.

As an application to **cancerous surfaces**, poultices prepared from the leaves have given relief, and ointments carefully prepared which contain the juice or small quantities of Conine, will be found of service. Lotions containing the juice or fluid extract will be found of use in open sores and persistent ulcerations.

In ovarian pain or pain from ulceration of the cervix uteri, or other persistent uterine pain or distress, a vaginal suppository containing a grain of Conium may be inserted at night, or twice daily, if the patient be recumbent. Rectal fissures and painful ulcers may be treated with rectal suppositories. Pain from acute pelvic inflammation may be relieved by this method.

CANNABIS.

CANNABIS INDICA.

Synonyms—Cannabis Sativa, Indian Hemp.

Part Used—The flowering top of the female plant grown in the East Indies.

Natural Order—Urticacæ.

Locality—Northern India.

Botanical Character—Cannabis Sativa is an annual herb, eight to ten feet high; stem branched, angular, tomentose, bright-green; leaves palmate, compound; leaflets linear, lanceolate, acute, serrate; flowers diœceous, yellow.

Indian Hemp as found in the market consists of the dried tops, cut off after flowering, and about two inches long, compressed, of a brownish-green color, with a few leaves, a large number of female flowers and some nearly ripe seeds, the whole agglutinated by resin, but quite brittle, of a narcotic odor and

bitter, acrid taste; solvent, alcohol. Dose, five to fifteen grains.

CONSTITUENTS—Cannabin, Cannabinine, Volatile Oil, Gum. Sugar, Potassium Nitrate.

PREPARATIONS—*Extractum Cannabis Indicae*, Extract of Cannabis Indica. Dose, one-sixth to one grain.

Extractum Cannabis Indicae Fluidum, Fluid Extract of Cannabis Indica. Dose, one to five minims.

Specific Cannabis. Dose, one to ten minims.

The strength of preparations varies, and some may be inert. If the precipitate formed when the drug is added to water is olive-green, it is active; but its strength should always be tested by tentative doses.

Physiological Action—*Cannabis Indica* is narcotic. In some persons the drug causes excitement tending to acts of violence and crime; in others it excites merriment, or a maudlin state. In general it produces hallucination, perverts the natural perception of objects, intensifies the perception of sound, dilates the pupils, abolishes pain, and, in poisonous doses, causes spasms, convulsions, collapse, pale, clammy, insensible skin, extreme debility, feeble pulse, and finally paralysis of respiration. The habitual use of the drug causes bloating of the face, weak, tremulous limbs, injected eyes, imbecility, and ultimately death from marasmus.

Therapy—*Cannabis Indica*, like opium, has a wide range of action through its general influence upon the nervous system, and because of this fact, writers have found much difficulty in properly classifying it. Bartholow classes it as a cerebral excitant. Its secondary effects are markedly depressing. It is sedative, narcotic, anodyne and, to a limited degree, anti-spasmodic. It acts upon disturbed function of the nervous system.

It is a remedy for disordered mental action.

It is a remedy for **disorders of motility**, involuntary irregular muscular movements, especially if of a distressing character.

It is a remedy to arrest or control **pain**, often acting advantageously in conjunction with other pain-quieting agents, intensifying, modifying or favorably influencing their action.

It is a remedy for excitable and irritable **hyperæsthetic** conditions of the **genito-urinary organs**, with increased functional activity and uterine disorders.

In the **wakefulness** of old age, in the **restlessness** of nervous exhaustion, and in **melancholia**, it is an important remedy. It is useful in the treatment of **neuralgia** and **hemicrania**. It takes high rank in affections of the brain and nerves of the head, especially if nervous vertigo be present, and in those attacks of hemicrania which occur periodically, very distressing, causing delirium and much prostration. It is especially applicable in **sub-acute inflammation** of the **brain**, in **delirium tremens** and in the **hypochondria** of the menopause.

This remedy has received a great deal of attention in its adaptability to cerebro-spinal meningitis, and with varying but encouraging results, especially in the earlier stages of irritation and congestion. It is useful also in hydrophobia, and in large doses it is certainly palliative to the distressing symptoms. Minute doses will cure some cases of tinnitus aurium.

It is useful in the distress of **Potts' disease** and hip joint disease and in general rickets. In **epilepsy**, either alone or combined with the bromides, it has been given very extensively for several years. In some cases the results have been excellent, where no benefit resulted from the use of the bromides.

The agent deserves a place as valuable in this condition. It is of much use in **paralysis agitans**, in relief of the tightening pains of **locomotor ataxia**, and especially in chorea and in general muscular tremblings. In chronic conditions accompanied by persistent pain it ameliorates the pain.

In **functional disorder** of the **stomach** accompanied by pain, it is an excellent sedative. In intestinal disorders it is equally applicable. It does not suppress secretions or disarrange the functional operations of the organs.

In aching and painful irritation or the passage of **gravel**, it is a most soothing remedy. It is beneficial here also in painful hematuria, whether from cancer or tuberculosis, from profound congestion or nephritis.

It is a soothing tonic to the uterine muscular structure, and in inertia and **subinvolution** it increases muscular power and energy and promotes contraction. It is useful in **menorrhagia** and **metrorrhagia**. It is a valuable sedative adjuvant to combine with the well known uterine tonics in general disorders of the pelvic organs amenable to medical treatment not of a surgical character, especially if the pains are of neuralgic or spasmodic character. It will allay **abnormal sexual appetite**, and will overcome the **hysteria** and emotional excitement which occur in some women at the menstrual period.

In **neuralgic dysmenorrhœa** it will cure patients who have been treated by all other methods without results. There are few remedies that will excel in this disorder, but the remedy must be given continuously, beginning before the expected paroxysm some little time and continued for a time after the paroxysm is relieved.

It is an excellent remedy in **gonorrhœa** with sexual hyperæsthesia. Here its influence is prompt; it arrests chordee, **priapism** and **spermatorrhœa**.

It controls violent erection and soothes the mental anxiety which aggravates the symptoms. It cures many irritable states of the bladder. It is curative in strangury and painful urination with burning and scalding. In spasmodic stricture, with

gelsemium or cimicifuga, it relieves quickly. It is a remedy for functional **impotence**.

It is soothing to irritable bronchial **coughs** and laryngeal spasm, and in coughs from tickling in the throat; also in whooping cough and in spasmodic coughs of whatever character. It is a common ingredient of cough syrups.

Co-operatives—The agent acts similarly in a general way with opium, gelsemium, passiflora, the bromides, chloral and hyoscyamus.

CHAPTER III.

AGENTS USED TO INDUCE SLEEP, OR TO CONTROL SPASM.

PASSIFLORA.	CHLORAL.	PARALDEHYDE.
HYOSCYAMUS.	CROTON CHLORAL.	SULPHONAL.
PISCIDIA.	CHLORALAMIDE.	TRIONAL.

PASSIFLORA.

PASSIFLORA INCARNATA.

Synonym—Passion Flower.

Part Employed—Whole plant.

Natural Order—Passifloraceæ.

Locality—Southern United States.

Botanical Origin—There are several species of *Passiflora* chiefly indigenous to tropical South America, while the *Passiflora Incarnata* is found in the southern United States. Plants of the *passiflora* family are herbs or woody plants with alternate leaves and conspicuous stipals, climbing by simple auxiliary tendrils; the flowers also auxiliary, usually with three bracts underneath, and a joint in the peduncle; calyx with very short cup and five divisions which are colored inside like the petals and often with a clawlike tip. Fruit edible, as large as a hen's egg, trailing or low climbing with three, deeply separate leaves, a pair of glands on the petiole and one or more on the small bracts; the purple crown of the handsome flower (two to three inches across), rather longer than the pale petals (Gray).

SOLVENTS—Water, alcohol.

PREPARATION—*Extractum Passifloræ Fluidum*, Fluid Extract of *Passiflora*. Dose, from ten minims to one dram. *Specific Passiflora*. Dose, from one to fifteen minims.

Physiological Action—*Passiflora* given in large doses causes spasms and paralysis in animals; and acts as a narcotic and antispasmodic in man, when given in moderate doses. No extended investigation concerning its physiological action has yet been made.

Specific Symptomatology—Wakefulness, disturbed sleep from mental worry, and exhaustion from cerebral fullness and from excitement. The wakefulness of infants and the aged. Not usually efficient if the wakefulness is caused by pain.

Nervous excitement, and irritation with muscular twitchings, evidences of approaching convulsions in childhood, with marked cerebral fullness. Is given at any time preceding or during convulsive paroxysms if it can be swallowed. It is indicated in **convulsions** of any character.

Therapy—In the **convulsions of childhood** it is a most reliable agent. The writer has given it at the onset of the spasm when the approaching symptoms were unmistakable, and has had the satisfaction of seeing all of the symptoms disappear so promptly in every case that perfect confidence has become established. It has controlled **severe spasms** while the irritating causes yet remained, and after all antispasmodics except anæsthesia had been ineffectual. It can be relied upon to hold the spasms in check while the causes are being removed, and reduces their force and character. In **epilepsy** it lessens the number of the paroxysms, but to ward off the paroxysms the attack must be anticipated by a full dose of the remedy. When its approach is unannounced the full effects of the agent are not obtained.

Passiflora has hypnotic properties which differ in many particulars in this class in that the sleep produced is normal in all its characteristics. The patient goes to sleep naturally, can be awakened as usual at any time to fall into a quiet natural slumber. He awakens at the usual time rested and refreshed, with no disturbance whatever of the cerebral functions. No languor, dullness or other disagreeable sensations. It will accomplish this result in insomnia from exhaustion and from overwork; in conditions of hysteria from nervous excitement, from exhaustion especially during fevers or the course of other diseases if there is no pain or distress, in the sleeplessness of infants and aged, and of the feeble, in sleeplessness from pain. In inflammatory conditions or after surgical operations it is not always as reliable.

If given in doses sufficiently large it may be relied upon to relax the tonic spasm of meningitis, and local tetanic spasm. It has relieved a few cases of **general tetanus**. It has cured tetanus in horses promptly. It may be given as an antidote to the spasms of strychnine poisoning, but it must be given in doses of from one-fourth to one-half ounce and frequently repeated. As an antispasmodic in cases where there is engorgement of the nerve centers, it is not contra-indicated. It relieves tonic and clonic spasms, and the spasms of sthenic as well as asthenic conditions.

The agent is not known to possess injurious or poisonous

properties. It has been used in erysipelas both externally and internally, and in acute inflammatory skin disorders with nervous elements and nervous complications.

HYOSCYAMUS.

HYOSCYAMUS NIGER.

Synonym—Henbane.

Part Employed—Leaves, flowering tops and seeds collected from plants of the second year's growth.

Natural Order—Solanaceæ.

Locality—Europe, Asia.

Botanical Character—Henbane is a biennial herb growing in sandy soil and waste places in Asia and Europe. The stem is two to four feet high, and rises in the second year. It is erect, round, green, branching, covered with long, weak glandular hairs, white, slimy and viscid, of fetid odor; leaves large, sessile, amplexicaul, ovate-oblong, serrate toothed; teeth large, triangular, pale dull green, two to ten inches long, one to four inches wide, pubescent, glandular, mid-rib prominent; odor, narcotic; taste, bitter; flowers numerous, nearly sessile, on a long, leafy, one-sided spike-like raceme; corolla, yellowish, streaked with purple veins; limb, five-lobed, about one and a fourth inch long, funnel shaped, deep purple at the orifice; fruit capsule, globular, half inch thick, dehiscing near the top by a cap; seeds, numerous, black, reniform, flattened; root, large, tapering, resembling parsley.

There are several varieties of Henbane, and, though all are medicinal, some are more so than others. Much depends on the time when the leaves are gathered, those of the second year being the best, and these should be gathered soon after the plant has flowered. The seeds are the chief source of the alkaloids.

The whole plant has a disagreeable odor and a repulsive appearance; solvents, dilute alcohol.

CONSTITUENTS—Hyoscyamine, Hyoscyne, Scopolamine, Hyospicrin.

PREPARATIONS—Extractum Hyoscyami, Extract of Hyoscyamus. Dose, from one to two grains. Extractum Hyoscyami Fluidum, Fluid Extract of Hyoscyamus. Dose, from five to twenty minims. Specific Hyoscyamus. Dose, from one to ten minims.

Physiological Action—Henbane is a narcotic and causes deranged vision, headache, giddiness, dilated pupils, dry throat, hoarseness, weakness of the lower limbs, spasms, cramps, paralysis, loss of speech, or loquacious delirium with hallucinations, followed by a dreamy sleep, according to the amount taken. A continuous use of the medicine causes an eruption of the skin,

of a red color, which is dry and itching. In some cases large doses cause furious delirium.

While power to temporarily increase nerve force—mild stimulant properties—is ascribed to Hyoscyamus, that influence is much less marked than in belladonna and stramonium, although its general effects are in many ways similar to these agents in medicinal doses. It is almost entirely devoid of irritant properties, but is soothing, calmative and sedative to a marked degree.

Specific Symptomatology—It is specific in excitable mental conditions, and in the violent and noisy delirium of fevers and acute inflammations, to **subdue** the **excitement** and to **induce sleep**.

In all conditions where there are busy delirium, hallucinations, weight in the front part of the brain, extreme activity of the mind, disturbed sleep with wild and frightful dreams, coma vigil, flushed face, wild, red and restless eyes, it is a sure remedy. In the restlessness, ceaseless agitation and insomnia of exhaustion, and in diseases of infants and of the extreme aged and feeble, it is especially applicable.

As a **hypnotic** for infants and the aged there is no happier agent than Hyoscyamus, in small doses. From five to ten drops of the fluid extract should be dropped into half a glassful of water, and a teaspoonful may be given every fifteen minutes, for two hours before the usual bedtime or until the patient sleeps. The sleep is quiet, restful, natural and not too sound. The patient awakens refreshed. It is indicated also in patients enfeebled from prolonged illness.

In headaches attendant upon the above irritable conditions the agent is applicable.

Therapy—It is valuable in the **pneumonia** of infants for its general soothing influence, and for its sedative effect upon the cough and respiration, and also in **bronchitis**, with short, sharp cough. A dry cough, increased upon lying down and relieved upon getting up, is surely relieved by its use.

It does not arrest secretion, and in this particular is in every way superior to opium. It does not disturb the mind or produce headache.

The anodyne properties of this agent are not marked in its general application, but administered in the **neuralgia** of exhaustion, in this variety of **neuralgic dysmenorrhea** and in **irritable** conditions of the **bladder**, as well as in the bone pains of **syphilis**, it exercises anodyne properties to a remarkable degree. In hepatic, renal, intestinal, ovarian and uterine **pain**, accompanied with great restlessness, it is of much value.

The alkaloid hyoscyamine sulphate, in doses of one-eightieth of a grain works better in the following cases than other forms of the agent.

In this dose it is advised in **paralysis agitans**, **locomotor ataxia**, the **tremors** of old age, and in **tetanus**. It is of value in **chorea**. In **chronic dementia**, with destructive tendencies and sleeplessness, in **insanity** with delusions and hallucinations, in epileptic **mania**, and, in fact, in mania of all forms, it is excellent.

Co-operatives—Gelsemium, stramonium, opium and passiflora incarnata, facilitate the action of hyoscyamus. The alkaloid duboisia is said to be identical with hyoscyamine. Atropine is also identical in many of its properties.

PISCIDIA.

PISCIDIA ERYTHRINA.

Synonym—Jamaica Dogwood.

Part Employed—The bark of the root.

Natural Order—Leguminosæ.

Locality—West Indies.

Botanical Description—Jamaica Dogwood is a tree, twenty feet high; leaves, imparipinnate; leaflets, seven to nine, oval, rounded at the base, entire, pubescent, with minute white dots beneath; flowers, whitish, with a purple tinge, arranged in paniced, four-winged racemes, downy, with short pedicels; calyx, downy, two upper teeth united, three lower bluntish; standard rounded, emarginate, greenish in the center, wings and keel colored at the apex; stamens, nine; ovary, linear, compressed; stigma, obtuse; stipe of the legume double the length of the calyx; wings, four, longitudinal, membranaceous, wavy, lacerated.

The bark comes in quills, four to six inches long, half an inch in diameter, covered with a corky layer, rough, wrinkled, bright orange-brown; cork under corky layer ash-gray, with transverse ridges and longitudinal wrinkles; inner surface brownish, smooth; interior of the tissue, blue-green; bast bundles arranged in irregular circles, separated by parenchyma, in radial rows between the medullary rays; breaks with a tough fibrous fracture; odor, narcotic; taste, bitter, acrid; solvent, alcohol. Dose, from a half to one dram.

CONSTITUENTS—Piscidin, Resin, Oil, Calcium Oxalate.

PREPARATIONS—Extractum Piscidiæ Fluidum, Fluid Extract of Piscidia. Dose, from a half to two drams.

Physiological Action—In moderate doses, Piscidia lessens sensation, induces sleep and increases the saliva and perspiration. In toxic doses it destroys sensation, paralyzes the respiratory centers, reduces the heart's action; first increases, then diminishes arterial tension and decreases the pulse rate. It first contracts, then dilates the pupils. It causes dyspnoea, spinal convulsions, general paralysis and death. It reduces

reflex action, inducing tetanic spasm by excessive stimulation of the spinal cord.

Administration—The agent must be given in sufficient doses and repeated. It is not active in small doses. It lacks the power of opium, but operates in the same lines as an analgesic, with desirable exceptions.

It is especially applicable in those cases where the patient cannot take opium or morphine. It does not produce toxic or undesirable effects in medicinal doses.

Specific Symptomatology—The agent, in doses of from a half drachm to a drachm, will produce quiet and restful sleep, when the insomnia is due to nervous excitement, mental worry or anxiety, and in elderly patients, neurasthenics and children.

Therapy—In susceptible patients it will control **pain** and relieve **general distress**. It is distinctly a nerve sedative, and overcomes nervous excitability and also reflex irritability. It is an antispasmodic of much power in mild cases. It does not cause dryness of the mouth or throat, like opium, by suppressing secretion, nor does it induce constipation. It does not distress the stomach or decrease the appetite or digestion.

If given during the course of **inflammatory fever** of any character, and in **inflammatory rheumatism**, it is a useful and grateful remedy. It does not oppose other indicated agents, and induces the often needed sleep.

In violent **spasmodic cough** it produces relief, and in the irritating persistent cough of **bronchitis** it is of service as an auxiliary to cough syrups. In **phthisis** it controls the night cough and induces restful sleep.

In **pelvic pain** it is especially efficacious, being of service in **dysmenorrhœa**, ovarian congestion and neuralgia, also in pain and distress from **uterine displacements**.

In **obstetrics** it controls erratic pains and conduces to quiet and rest, and overcomes rigidity by its specific relaxing or antispasmodic influence, although it does not interfere with the normal uterine contractions.

In the distress following the **adjustment of fractured bones** or reduction of dislocations it is especially useful and satisfactory.

It is often applied to local painful conditions with benefit. It relieves **toothache**, local **neuralgias**, and the pain of developing **felons** and boils. In these cases it exhibits active anodyne properties.

CHLORAL.

Synonym—Chloral hydrate.

Trichloraldehyd with the water of crystallization.

C_2HCl_3O is the formula for Chloral proper. The Chloral hydrate has H_2O added to the formula.

The name Chloral is authorized when Chloral hydrate is intended. If Chloral proper is intended, the U. S. Dispensatory specifies **Anhydrous Chloral**.

Character—Chloral hydrate is a crystallized body, transparent, but usually of a whitish appearance, from the presence of a white powder, the crystals being irregularly broken. It has a pungent, acrid, caustic, bitter and permanent taste, a great objection to its administration, and a rather penetrating aromatic odor. It sublimes slowly and recrystallizes on a cold surface after the manner of iodine, but in fine white crystals. It is freely soluble in water, and in nearly all menstrua combining with camphors as hereafter specified.

Physiological Action—In overdoses there is a marked slowing of the circulation and respiration, with a reduction of the temperature. The pulse ultimately becomes feeble, rapid and irregular, and finally thready. There is general profound muscular relaxation. Coma occurs and death follows from paralysis of the heart and respiratory centers. Post-mortem examination shows profound hyperæmia of the meninges, and also of the structure of the brain and cord, probably from extreme relaxation of the capillaries. In medicinal doses it is believed to produce anæmia of the central nervous system, hence its value in great cerebral excitement with engorgement.

The influence of Chloral in full therapeutic doses is exercised in the production of sleep. If it be taken on a comparatively empty stomach the patient becomes quiet in half an hour, and the sleep lasts from two to six hours, according to the previous condition of the mind, whether tranquil or disturbed. It usually produces a dreamless, natural sleep, followed by no unpleasant symptoms. Occasionally, however, the dose fails, and the second or third dose is necessary. At other times it produces cerebral distress or headache, nausea, faintness and extreme lassitude. There is no marked apparent influence upon the pulse or respiration in normal cases, but the pupil contracts somewhat. During the period of induced sleep the patient may be awakened to full consciousness, may take food, may even transact items of business, and then lie down and almost immediately fall into a continued natural sleep. Cough is not always allayed by it, and this will awaken the patient, or a desire to urinate may awaken him.

Chloral has but little influence over pain. It may be given during pain to induce sleep. If that result is accomplished by

sufficient dosage, the patient's countenance shows the presence of pain, and he will complain upon waking of its having continued during his sleep.

Greatly prolonged use of Chloral produces impairment of the appetite, bad taste in the mouth and bad breath, with fetid fecal discharges, deficient secretion of the gastric and biliary fluids, and an increase of the nervous phenomena for which it is usually prescribed; also an eruption, irritation, or ecchymosis and red rash of the skin with desquamation.

Contra-Indications—Chloral is contra-indicated in feebleness with exhaustion, or when there is a tendency to stupor or coma or general dullness, and in cerebral anæmia. It is contra-indicated in weak heart, especially if existing in alcoholism.

Specific Symptomatology—The direct influence of Chloral is that of a profound **nerve sedative** and a **producer** of quiet, restful and natural **sleep**. In its influence over the muscular system it produces profound **relaxation** similar to that of gelsemium, but attended in extreme cases, or where the heart is feeble, with more danger.

Therapy—It is a promoter of quiet and repose in all conditions of nervous excitability and extreme restlessness. In the excitement and **noisy delirium** of **fevers** no agent acts more satisfactory. It quiets excitement, overcomes the delirium if due to cerebral engorgement and induces normal sleep.

It is a superb remedy in the sleeplessness of **inflammatory fevers**, and in the earlier stages of **typhoid** and other continued **fevers**. In the later stages when the vital force is exhausted it must not be given.

Chloral will induce sleep in **chorea**, and during the sleep the symptoms will abate, but it does not cure the difficulty.

Chloral is of much value in **hysteria** and the nervous phenomena of this condition. It is best given in conjunction with a stimulant in asthenic cases, as it possesses no inherent stimulating properties.

It is a reliable remedy in **pruritus** from nervous causes, especially pruritus vulvæ of pregnancy, with nervous erethism which causes increased nervous phenomena and prevents sleep. One or two doses of fifteen grains will often control the condition for a day or two.

In **puerperal convulsions** Chloral is a most reliable remedy and is often used.

In **rigid os uteri**, with or without general nervous irritation, with hot vagina and irritable nagging pains, and no advancement of the labor, Chloral is a most useful remedy. Fifteen grains repeated if necessary in half an hour will usually cause an entire change in the condition. It will quickly relax the rigid os and change the entire character of the pains. It will quiet the nervous excitement, and the patient may have an interval of restful sleep.

It acts most promptly in such a case if a diluted solution of twenty or thirty grains is injected into the rectum previously evacuated with a hot enema. Its influence is salutary and it does not in these doses usually interfere with uterine contractions or subsequent involution.

It is a useful hypnotic in the sleeplessness of the aged, with whom small doses exercise a satisfactory influence. The influence of Chloral upon children in small doses of from one to three grains is very soothing. In nervous and restless children with disturbed sleep, children who toss about during the entire night or cry out frequently, or awake in terror, this agent has a charming influence. A small dose should be given an hour before bedtime and repeated as the child is put to bed, from three-fourths of a grain to a grain and a half for each year of the child's age. This should be repeated on two or three consecutive nights, if no unpleasant symptoms appear, when the bad habits will be temporarily broken. On their reappearance it may be resumed again for a night or two. The cause of the restlessness should be discovered and relieved also.

Chloral is a most excellent remedy in convulsions of children. It is safe in proper doses and powerfully antispasmodic. In combination with the sodium, or potassium bromides, a solution may be kept at hand for emergencies, and will prevent approaching spasm and promptly control those existing. It will allay nervous twitchings and other evidences of nerve irritation, and will soothe and quiet the patient and induce refreshing sleep. It is not to be given if the convulsions occur from exhaustion or after prostrating disease.

It is useful in **whooping cough** and in the paroxysm of spasmodic **asthma**. It will relieve **asthmatic dyspnœa** when dependent upon nerve irritation.

It is used in **epilepsy** with advantage. In nocturnal **petit mal**, if the attack can be anticipated, a full dose at the bed hour will usually ward it off.

In **tetanus** Chloral is in common use, full doses being necessary. A physician whose name we have now lost, reported several years ago that he had cured several cases of traumatic tetanus by opening the wound freely and filling it with finely-powdered Chloral to the extent of sixty grains.

It is a most reliable agent in **delirium tremens**, and in **acute mania** and in the **paralysis** of the **insane**. It soothes excitability as well as induces sleep.

Theoretically, Chloral should prevent the excretion of sugar in the urine in **diabetes mellitus**. In practice, a few cases only have been so benefited. It deserves further investigation in this line.

Chloral is not a remedy for hypodermic injection; it produces local irritation and abscess.

A mixture of Chloral and menthol, and Chloral and camphor, each produces a homogeneous compound liquid substance which quiets pain, in some cases quickly, on external application; applicable principally to toothache and neuralgia. The agent liquefies also with thymol and carbolic acid.

If given in very large doses, it will antidote the effects of poisonous doses of strychnine.

Chloral is an antiseptic, an irritant, and even a blistering agent when confined locally. It is asserted to act as a local anæsthetic, but this is questionable.

As with morphia, some individuals exhibit an idiosyncrasy which precludes the use of Chloral, and, consequently, the beginning doses should be small until its influence is known.

With many eclectic physicians the use of Chloral is largely superseded by the use of *passiflora incarnata*, an agent which in full doses has many of the virtues and none of the disadvantages of the former, except its disagreeable taste.

CROTON CHLORAL.

Synonym—Butyl chloral hydrate.

Occurrence—Formed by the action of dry chlorine gas on aldehyde, to which water is added.

Character—It is a crystalline substance, forming in white scales. It has a characteristic pungent fruitlike odor and a nauseous taste.

It is freely soluble in hot water, glycerine, alcohol and ether. It is sparingly soluble in cold water. All solutions are readily decomposed.

Administration—From three to five grains are given either in solution or in a capsule every two hours, or ten grains, as a single dose, may be given. The maximum dose is twenty grains.

Physiological Action—In its physiological effect it is very similar to chloral, but is less depressing. Full doses produce deep sleep, with paralysis of the terminal filaments of the nerves of the head, with slow, deep, finally labored respiration. The action of the heart is apparently uninfluenced until the last.

Therapy—If the agent be given in medicinal doses it produces a tranquil, restful **sleep**, but in this it is not equal to chloral hydrate. It is prescribed for the cure of **headaches** of nervous origin, and those due to eye strain. Neuralgia and spasm of the nerves of the face, especially neuralgia of the fifth pair, and tic douloureux, are controlled by it.

CHLORALAMIDE.

Synonym—Chloral formamide.

Character—This derivative of anhydrous chloral, by the action of formamide, occurs in colorless crystals of a lusterless appearance with a bitter taste.

It is slowly soluble in water, more freely in dilute alcohol. It is decomposed by heat and alkaline salts.

Administration—The full adult dose is thirty grains, dissolved in water and flavored to conceal the taste.

Therapy—Chloralamide acts in much the same manner as chloral both in toxic and in medicinal doses, but is slower in its action and not as reliable.

It is a **sleep** producer with all the virtues of chloral, and the advantage that it does not act so profoundly upon the heart. It may be given in some feeble cases, and where the heart is weak and irregular, without much danger.

It is not usually prescribed for sleeplessness where there is pain, as its influence is, to a great extent, antagonized. In this, however, there is a diversity of opinion. It is advised in all cases where chloral is indicated. Specifically we would say in the **sleeplessness of nervous patients and neurasthenics**. It lacks any irritating influence on the stomach and is useful in general gastric irritability, especially if of reflex origin. It is used often in seasickness with good results.

PARALDEHYDE.

Synonym—Elaldehyde.

Character—A polymeric modification of the acetyl aldehyde. It is a clear, colorless liquid, unstable in the light, with an ethereal but not agreeable odor, and a burning, unpleasant taste. It is soluble in ether, alcohol and in the fixed oils; also in ten parts of water. Dose from three to ten grains.

Physiological Action—It produces a small degree of anæsthesia and muscular relaxation. It decreases the functional activity of the spinal cord and of the motor and sensory trunks. It slows the heart after prolonged use and paralyzes the respiratory centers.

Therapy—In medicinal doses, not persisted in, it seems to encourage the action of the heart and increase arterial tonus. It is thus a good diuretic and is not contra-indicated always if the heart is weak. It is similar to chloral in its sleep-producing qualities, acting as a sure and satisfactory **hypnotic** in certain cases. It is eliminated by the kidneys and increases the excretion of urea.

It is so similar to the other hypnotics of its class that it is difficult to say in which particular it is superior. The large and unpleasant dosage is an objection to its use. It is not growing in favor.

SULPHONAL.

Synonym—Diethylsulphonedimethylmethane.

Occurrence—This synthetic product is complex in character, and in process of manufacture. It is a distinct chemical substance, but the process of its manufacture is proprietary.

Character—It occurs in peculiar prismatic, crystalline form, is colorless, almost tasteless, odorless, and very stable. It dissolves in about fifteen parts of boiling water, but is very slowly soluble in hot alcohol, and indifferently acted upon by acids.

Administration—The dose is from fifteen to thirty-five grains. Its large dose and insolubility render its administration difficult. It is suspended in mucilage or syrup, and must be administered several hours before its influence is desired.

It is best given in hot solution upon a comparatively empty stomach, as it is only appropriated by decomposition, and not by the rapid absorption of a free solution. Its influence is so slow that it is often not exercised, when given to produce sleep, until the night has passed, causing the patient to pass a drowsy, uncomfortable day.

Its German origin has caused it to be much used in America, but there is no doubt that we have many superior agents. It is unreliable because of the difficulty of its appropriation, often producing only prolonged discomfort.

Physiological Action—It is not considered a poisonous agent, and yet much discomfort arises from its use with some patients. Symptoms of a toxic character will appear; difficulty of speech, temporary muscular inco-ordination, fullness of the head and vertigo; in prolonged cases, physical weakness, mental incapacity, forgetfulness, delusions and mental aberration. It colors the urine a deep red, disarranges the stomach and bowels, and sometimes produces a characteristic rash on the skin.

Therapy—It is decidedly a **hypnotic**, but is not as reliable or as active as chloral, and yet it sometimes succeeds where that agent has failed. It is used in the **sleeplessness** of **alcoholics** and in **delirium tremens**. It has won its reputation largely in this latter condition. Its tastelessness is a redeeming quality, as it can be given without the knowledge of the patient.

It does not irritate the stomach or bowels, neither does it suppress secretions. It does not affect the digestion or destroy the appetite.

Specific Symptomatology—It is a remedy for sleeplessness when the brain is overcharged and the mind is excited or worried. It is useful in those greatly worried over physical conditions, such as those suffering from **gonorrhœa** or **spermatorrhœa**.

In **mania** with extreme **nervous excitement** and general nerve irritation, and in pronounced insanity, it has been widely used with excellent results.

It is useful in **prolonged fevers** because of its non-irritating and non-depressing character.

It quiets the restlessness of teething children, soothes the gums like the bromides, wards off spasms and induces sleep. It is safe, and the little ones are probably more susceptible to its influence because of increased facility of appropriation. Its tastelessness is in its favor here also.

TRIONAL.

Synonym—Diethylsulphonemethylethylmethane.

Character—This agent is derived from sulphonal. It crystallizes in brilliant scales and has a bitter taste. It is soluble in alcohol and in 320 parts of water. The dose is from eight to twenty grains.

Therapy—It is hypnotic in its action, having been used in the **nervous disorders** and **sleeplessness** of the **insane**. It is similar to sulphonal and tetronal.

TETRONAL.

This substance is in every way similar to trional, but is not as soluble. It is used for the same purposes and in the same doses.

URETHANE.

Synonym—Ethylurethane.

Occurrence—This synthetic product is formed by the action of ethylic alcohol upon the nitrate of urea.

Character—It is crystalline, odorless and tastes somewhat like potassium nitrate. It is quite freely soluble.

The dose is from ten to forty grains. It is administered in doses of four or five grains hypodermically.

Therapy—It is lauded as a **hypnotic** and sedative. Antispasmodic results are claimed in the **nervous irritations** and

spasms of childhood. It is claimed that it will antidote strychnia and control tetanic spasms to an extent.

URALIUM.

Synonym—Uralchloralurethane.

By acting upon urethane with chloral in the presence of the strong mineral acids this substance is formed. It has all the properties of urethane. Its hypnotic powers are especially great. The dose is the same as urethane.

CHAPTER IV.

AGENTS COMMONLY USED AS SEDATIVES TO GENERAL NERVOUS IRRITABILITY — SPECIFIC NERVE SEDATIVES.

ASAFÆTIDA.	LACTUCARIUM.	BROMAL HYDRATE.
SCUTELLARIA.	CURARE.	BROMOFORM.
HOPS.	APLOPAPPUS.	AMMONIUM VALERIANATE.
AMBER.	BROMINE.	HYDROBROMIC ACID.
VALERIAN.	BROMIDES.	HYDROCYANIC ACID.

ASAFÆTIDA.

FERULA FÆTIDA.

Part Employed—The dried milky juice obtained by incising the green matured root of the *Ferula fœtida*.

Natural Order—Umbelliferae.

Locality—Persia, Afghanistan.

History—The *ferula fœtida* from which *Asafætida* is obtained has a tapering root like the parsnip, varying in size from an inch in diameter to the thickness of a man's leg, with a cabbage-like head when young, which is used as greens by the natives and eaten raw. The juice is also used as a condiment as well as for medicinal purposes. Kaempfer gave some account of it in 1687, and Falconer first described it in 1838. Other travelers have given accounts of it. Bellew, in 1872, witnessed the collection of the gum, and Aitcheson, in 1884, saw the plant growing on the high plains of Afghanistan.

Occurrence—After the plant is four years old, and before the flower-bearing-stage in June, the *Asafætida* is obtained. The top being twisted off, the root is laid bare, in April, for a few inches, and forty days afterwards a thin slice is removed, when a milky juice exudes. In a week as the juice dries it is scraped off and preserved. At a somewhat longer interval another slice is removed and the exudate preserved as at first; additional slices being cut away to expose a fresh surface, the col-

lection of the gum is continued until no more juice exudes. The root during this time is protected from the rays of the sun by having the tops and leaves of the plant spread over it. The plant must be allowed to attain a certain degree of maturity before the collection of the gum is begun, which is at the time when the leaves begin to decay.

Character—The gum appears as tears imbedded in a sticky mass. The color is at first white, which soon changes to brown on exposure. It has an extremely offensive odor and a bitter taste. It has been esteemed as a medicine in the East from a remote period. Solvent, alcohol. Dose, from five to twenty grains.

Botanical Origin—*Ferula foetida* is a large perennial herb, with a stem five to ten feet high, about six inches in circumference at the base, erect, greenish, smooth, solid, furrowed, herbaceous; leaves are few, springing from near the root, spreading, three-parted, a foot and a half in length and about the same in breadth, shining, conaceous, bipinnatifid, lanceolate, petiole, round, stout, channeled at the base, decurrent. In the midst of the leaves rises a luxuriant stem terminating in a large head of compound umbels with ten to twelve rays; flowers small, polygamous, pale-yellow; fruit foliaceous, slightly hairy, larger and darker than the parsnip.

CONSTITUENTS—Resin, Gum, Volatile Oil, Sulphur.

PREPARATIONS—Emulsion Asafœtidæ, Emulsion of Asafœtida. Dose, two ounces.

Pilulæ Asafœtidæ, Pills of Asafœtida. Dose one to four pills.

Tinctura Asafœtidæ, Tincture of Asafœtida. Dose, one to two drams.

Specific Symptomatology—This agent is a mildly stimulating nerve sedative. Its soothing influence upon the brain is of no mean order. This is especially observed in **hysterical conditions**, in hystero-epilepsy and in hypochondriasis. It arrests hysterical paroxysms and produces quiet and rest with a pleasant sense of exhilaration. It relieves the flatulence of hysteria also. In nervousness, especially that of weakened and exhausted conditions, and of children, it is soothing, and often wards off spasms.

Therapy—In spasmodic conditions of the stomach and bowels with **tympanites**, in the absence of active inflammation it is a remedy long used. In accumulations of gas in the stomach or bowels it has been used to the best advantage.

The disgusting odor of the agent more than counterbalances its desirable therapeutic influence, and it is because of this odor and its long continued eructation after ingestion, that its use is almost abandoned by many physicians, and it is replaced by as efficient and less disagreeable remedies.

In **spasmodic bronchial affections**, in **whooping cough** and in **asthma** it was a favorite with the older doctors. In the bronchial catarrhs of the aged and infants it has been given with advantage, especially if nervous depression was present. A three-grain pill is the celebrated "Keeley cure" for la grippe, and those who have used the remedy in epidemic influenza are usually enthusiastic in its praise.

In all sympathetic coughs of a reflex origin it has been advantageously used. Its influence upon the entire respiratory system is apparently due to its sedative influence exercised upon the nerve centers.

SCUTELLARIA.

SCUTELLARIA LATERIFLORA.

Synonyms—Scullcap, madweed, hoodwort.

Part Employed—The whole plant.

Natural Order—Labiatae.

Locality—United States.

History—The *Scutellaria lateriflora* is an indigenous perennial herb growing in damp places, and flowering in July and August, at which time it should be gathered, dried in the shade and kept in airtight containers. As the remedy is often found to be inert, great care should be taken in its preservation.

Botanical Description—Its stem is one to three feet in height, erect, quadrangular, smooth, branched; leaves, ovate, opposite, petiolate, two inches long, acuminate, coarsely serrate, thin and smooth; flowers small, arranged in long, lateral, axillary leafy racemes, of a pale blue color, subsessile, bilabiate, upper lip helmet-shaped, with a minute filiform bract at the base of each pedicel, each flower axillary to a bract, pedunculated; calix entire, which, after corolla has fallen, is closed with a helmet-shaped lid; tube of corolla one-fourth inch long, upper lip concave, entire, lower three-lobed; seeds four, oval, verrucose, inclosed in calix. Plant inodorous, taste bitterish; root small, yellow, fibrous; solvent dilute alcohol and boiling water.

CONSTITUENTS—A bitter principle (crystalline glucoside), volatile oil, fat, tannin, sugar.

PREPARATIONS—*Extractum Scutellariæ Fluidum*, Fluid Extract of *Scutellaria*. Dose, from five to thirty minims. *Infusum Scutellariæ*, Infusion of *Scutellaria*.

Specific Scutellaria. Dose, from one to ten minims.

Therapy—The older writers ascribe nerve sedative properties to this agent, and there is no doubt that a strong infusion will yield results not obtained from small doses of the pharmaceutical preparations. It is given in **irregular muscular action**

as in **chorea** and **paralysis agitans** with good results. Combined with *cimicifuga* in chorea, it has promoted the cure of many cases.

It is soothing to an irritable nervous system and produces quiet and restful sleep. It has been used for this purpose in **delirium tremens** in large doses. In restlessness or nervous excitability producing **insomnia**, and in prolonged fevers it promotes sleep and at the same time stimulates the skin and kidneys to increased activity. Its soothing influence is retained after the agent is discontinued. The agent was at one time supposed to exercise an influence over the spasms of hydrophobia, but it is doubtless too feeble for such a purpose.

HUMULUS.

HUMULUS LUPULUS.

Synonym—Hops.

Part Employed—The strobiles.

Natural Order—Urticaceæ.

Locality—North America, Europe.

Botanical Description—The hop has a perennial root, from which spring many small, annual, climbing, angular, rough, hairy stems which often reach a great height; leaves opposite, on long, winding, rough petioles, smaller ones cordate, larger ones deeply five-lobed; deep-green, serrated, rough, veined; flowers, diœcious, axillary, male flowers peduncled, yellowish white; female flowers pale-green, in densely leafy, cone-like spikes which are the source of the hops of commerce. The strobiles are one and one-fourth inch long and consist of ovate, membranous, light-green scales, reticulately veined above, parallel veined below, glandular; developing two hard, minute, globular achenia at the base which are covered with numerous yellow and shining glands (lupulin); odor, aromatic; taste, bitter, aromatic, astringent; solvents, diluted alcohol, boiling water. Dose, from half a dram to one dram.

CONSTITUENTS—Volatile Oil, Resin, Trimethylamine, Asparagin, Tannin.

Lupulinum, Lupulin, is a glandular powder separated from the strobiles of hops and is a bright brownish-yellow color, with the odor and taste of the drug, and in which its principal strength resides. Dose, from five to ten grains.

PREPARATIONS—Tinctura Humuli, Tincture of Hops. Dose, from one to two drachms. Extractum Lupulini Fluidum, Fluid Extract of Lupulin. Dose, from ten to sixty minims. Specific Lupulin. Dose, from one to ten minims.

Action—Tonic, nervine, hypnotic.

Physiological Action—Hops stimulates the stomach, improves its tone, encourages the appetite and assists the diges-

tion. It adds force and volume to the heart, and when irritated and irregular from gastric irritation it acts as a soothing agent to overcome those conditions.

Specific Symptomatology—The influence of this agent is marked in those cases of **nerve irritation** and **wakefulness** where anxiety and worry are the cause. In this it is somewhat similar to hyoscyamus. It is more particularly serviceable in those cases where **sexual irritation**, spermatorrhœa and dread of impotence are present, and where there is abnormal or erratic, and at times violent sexual excitement.

Therapy—In all forms of nervous excitement it is soothing in its influence, and a hypnotic of much value. This is especially the case in **hysteria** and in the sexual irritation of females.

In mild conditions of **insomnia**, with persistent worry, in patients recovering from neurasthenia, and in hysterical patients, or in cases where there is no organic difficulty or pain to cause the wakefulness, small and frequent or single full doses of this agent will have a marked tranquilizing effect. A pillow of hops will have a soothing influence in some of these cases, and may be all that is needed to induce sleep.

Fomentation made by dipping a muslin bag filled with hops into hot water, wrung out and applied over painful **acute local inflammations** and painful swellings, is a favorite domestic measure. It is an excellent plan to cover the poultice with a piece of rubber protective or oiled silk, and where the weight can be borne, if the rubber water bag containing a small quantity of hot water be laid over this, no change need be made for two or three hours. Applied to **facial neuralgia**, or an ulcerating tooth, or in the earache of children, it at once allays pain and promotes sleep.

In the treatment of **delirium tremens** a capsule containing a grain of capsicum and eight grains of Lupulin given during the intense excitement preceding the attack will sometimes ward it off. Half of a teaspoonful of each of the tinctures in combination may be given. This may be continued every two or three hours with full satisfactory effect, especially in the mild cases. This serves to replace the use of alcohol in case the patient is deprived of such drink, and accomplishes that result satisfactorily. A strong infusion of hops and Cayenne pepper is excellent in this case to be drunk hot and as demanded.

The **anaphrodisiac** influence of this agent suggests its use in **priapism** and in **chordee**, and in spermatorrhœa where these conditions exist, and where there is sudden active determination of blood to the parts. It is not the remedy when the parts are cold, weak, inactive and non-excitabile, and where the erections are feeble or impossible. Five to ten grains of Lupulin at bedtime, with ten or fifteen drops of the fluid extract of ergot

in those cases where the tendency of fullness of the circulation is marked, will preserve rest and quiet for the night. A full dose of camphor monobromate with Lupulin is excellent.

A suppository containing Lupulin and camphor monobromate, five or six grains of each, or the one-fourth of a grain of ergotin, may be inserted into the rectum at bedtime with fine results.

The use of beer as a restorative and tonic can be replaced entirely by the tincture of hops, or of some of the forms or methods named. Many physicians advise beer for tonic purposes, and there is no doubt that in some cases some little good is accomplished, but all the good can be accomplished in much less time by other direct measures. Valuable time is apt to be lost by depending upon such an inefficient agent. Its medicinal value is nil, and the multitudes of malt tonics advertised by beer manufacturers are only an improved quality of beer sold by this method instead of over the bar.

SUCCINUM.

PICEA SUCCINIFERA.

Synonym—Amber.

Occurrence—A fossil resin obtained in alluvial deposits from trees of the coniferæ, which, usually, have been submerged in sea water. It is found principally in the Baltic Sea and in Prussia. It is found at times in coal mines. It is an oleo-resin by natural exudation from submerged forests, and is found along the sea shore above or beneath the water.

Character—It occurs in irregular pieces, sometimes weighing as much as ten or twelve pounds. It is a dull, hard, rough, brittle substance, tasteless and odorless except when heated. It is used for preparing succinic acid. It yields an empyreumatic oil—oleum succini, oil of amber. It is a volatile oil of a pale yellow color, an agreeable balsamic odor and of a warm, acrid taste; soluble in alcohol and ether. The color deepens and the oil becomes thicker on long exposure.

Oleum Succini Rectificatum is the rectified oil of amber and the form of the agent in use in medicine.

Therapy—The oil may be given in doses of from five to ten drops. It is an antispasmodic and stimulant. It is diuretic also in its action, and is of much use with some physicians for external as well as internal use in **inflammatory rheumatism**.

It has been highly lauded in **epilepsy**. It is used in hysteria also, and in infantile convulsions and in all spasmodic coughs.

VALERIAN.

VALERIANA OFFICINALIS.

Part Employed—The rhizome and roots.

Natural Order—Valerianaceæ.

Locality—Europe, Asia, United States.

Botanical Origin—Valerian is a perennial herb, two to four feet high, branching at the top, stem smooth, hollow, furrowed, hairy; leaves pinnate, opposite, on long petioles; leaflets, four to ten pairs, lanceolate, coarsely serrated, sessile, smooth; flowers small, white, flesh-colored, fragrant, in compound cymes, triandrous; corolla five-lobed, sessile, funnel shaped; fruit ovoid, compressed achene, capsule one-sixth inch long, one-sided, pale-brown, terminating with a plumose pappus; rhizome abconical, truncate at both ends, upright, yellowish-brown, marked with leaf-scars, with numerous long dark-brown rootlets, two to six inches long and one-eighth inch thick at the base; odor peculiar, unpleasant; taste, camphoraceous; solvents, alcohol, water.

CONSTITUENTS—Volatile oil, valerianic, malic, acetic and formic acids; tannin, sugar, starch, mucilage, extractive, resin.

PREPARATIONS—*Extractum valerianæ fluidum*, fluid extract of valerian. Dose, ten minims to two drams. *Specific valerian*. Dose, five to sixty minims. *Tinctura valerianæ ammoniata*, ammoniated tincture of valerian. Dose, one to two drams. *Oleum valerianæ*, oil of valerian. Dose, one to five minims.

Physiological Action—Valerian in large dose stimulates the brain, causing headache, giddiness, perverted vision, restlessness, agitation, nausea. Large doses of the oil cause increase of urine with slow pulse and drowsiness, ending in deep sleep. It lessens sensibility, motility and reflex excitability, and, if the dose be large enough, causes central paralysis. The first effect is stimulation, followed by depression of the nerve centers.

Specific Symptomatology—Valerian is not a narcotic. Its influence upon the nervous system is best obtained when the circulation of those centers is inactive and feeble, especially when there is a paleness of the face and the skin is cool. It is directly indicated in hysterical conditions of whatever character, with nervous excitement and morbid vigilance, in hysterical epilepsy, and in nervous headaches with some pallor. It is excellent in the hysteria and nervous disturbances incident to the menopause. Its general soothing effect in all these cases is desirable. It controls distress and imaginary pain and produces quiet, permitting sleep and rest.

Therapy—This agent has long been known as a nervine. It is gentle and soothing in its influence upon the nervous system, especially upon the spinal centers. It is applicable in the **nervousness of depression** because of its gentle stimulating

influence, and in these cases its influence is heightened by combining it with stimulants.

This result is effectually obtained in the valerianate of ammonium, which is the most active of the valerian compounds. In conditions where the nervousness is induced by hyperactivity, actual increased nerve force, or where there is organic disease, it is not the remedy.

The agent exercises a good influence in combination with *cimicifuga* in the treatment of **chorea**. Its influence upon disordered motility, although not marked, is similar to that of *cannabis indica*, *hyoscyamus* and *scutellaria*.

In pruritus, with nervous excitement from feebleness, it is a desirable agent. It has been used in stomach disorders and in diabetes, but its influence is not marked in these cases.

LACTUCARIUM.

Synonym—Lettuce.

Part Employed—The inspissated juice of the *Lactuca virosa*.

Natural Order—Compositæ.

Locality—Europe.

Botanical Description—*Lactuca virosa* is a biennial herb; stem two to three feet high; crest, prickly near the base, above smooth, cylindrical, pale-green, often purple—spotted, branching; leaves at the foot petiolate, sixteen to eighteen inches long, obovate, entire irregularly spinously toothed, wavy, pale, green beneath, prickly on the mid-rib, cauline leaves smaller, alternate, clasping, and often lobed, sessile, horizontal, sagittate, amplexicaul, with an acute spinous apex, floral ones reduced to small pointed bracts; flower heads numerous, panicled, on short axillary peduncles; bracts cordate, imbricated and pointed; involucre conical, composed of three rows of imbricated lanceolate bracts; florets neutral, ligulate, pale-yellow; pappus rough; odor disagreeable, narcotic; taste bitter, saline.

Lactucarium, the concretic juice, is collected at the time of inflorescence when most abundant, by cutting the stem and imbibing the milky juice that flows out by a sponge, and squeezing it into a vessel containing a little water. It is then left in a dry place until it becomes a solid mass. It appears in sections or irregular lumps, the size of a pea, of a reddish brown color externally, inside whitish, yellow, waxy lustre, or in lumps weighing several ounces, with the odor and taste of the plant. Solvents: alcohol, chloroform. Dose, from one to eight grains.

CONSTITUENTS—Lactucarin, lactucin, lactucic acid, lactucopictin.

PREPARATIONS—Tinctura Lactucarii. Tincture of Lactucarium. Dose, from ten to thirty minims.

Therapy—Lactucarium has mild anodyne and hypnotic properties. It is a nerve sedative and acts as an expectorant in lung troubles.

It is frequently used in cough syrups, as it has quite a specific influence in allaying irritable coughs. In the form of a syrup, it is a vehicle for other remedies, when a soothing agent is desirable.

It is given to allay distress and pain in cases where there is an idiosyncrasy against the action of opium and its salts, or where for other reasons these agents cannot be prescribed.

It does not suppress secretion or disturb the digestion. It is uncertain in its action, however, and unreliable.

CURARE.

Synonyms—Worara, Wourara, Woorara.

Character—A South American arrow poison, occurring as a dark-colored or blackish extract, derived from the strychnos and cocculus families. Dose, one-fiftieth to one-tenth of a grain, used hypodermically.

PREPARATION—From Curare there is precipitated a crystalline, deliquescent alkaloid, **Curarine**, the dose of which is from one-hundredth to one-fiftieth of a grain; hypodermically, from one-two-hundredth to one-one-hundredth of a grain.

Therapy—The agent is a powerful depressant to the motor-nervous structure. It is antagonistic to the action of strychnia and other nerve excitants. It was at one time quite popular in the treatment of **tetanus**, hydrophobia and other profoundly tetanic conditions. It was used also in **epilepsy** and in **convulsions**.

The profound physiological effects induced by the agent in the original experiments made to determine its character, suggested a train of conditions in which it would seem to be an important agent. The variable character of the preparations which have been on the market have caused it to be almost entirely dropped by therapists. It is now but little used.

APLOPAPPUS.

APLOPAPPUS LARICIFOLIUS.

Synonym—Herba del Pasmó.

Natural Order—Compositæ.

Locality—Texas, New Mexico, Arizona, California and Northern Mexico.

This may be closely related to the damiana. We insert it

here, that it may be kept before the minds of our readers until its properties are determined. Webster and others mention it as a remedy in **tetanus**. Its infusion is used by the native Mexicans and Spaniards for this condition. It has also cured many stubborn cases of **chorea**. In **convulsions**—**epileptic**, **hysterical** and **puerperal**—its antispasmodic properties have been proven by many marked cures. It deserves thorough investigation.

BROMINE.

Symbol—Br.

Character—Bromine is an elemental substance—a heavy, blood-red, fuming liquid. It has a strong, irritating, offensive, pungent odor, and is corrosive to animal tissues. It is soluble in thirty-three parts of water, at 60 deg. Fah.; is freely soluble in alcohol, chloroform, ether and the carbon disulphide. It is similar to chlorine in its action, but is less active.

Occurrence—It was discovered by Balard in 1824, in sea water.

It is not found free, but always in combination with the alkalies in sea water and mineral springs.

It is obtained from sea water. The water is evaporated until the more easily crystallizable salts are precipitated. The mother liquid is then treated with sulphuric acid, and the black oxide of manganese, which sets chlorine free in the mixture. This, from its superior chemical activity, replaces the Bromine, setting it free in the form of a vapor, which is conducted into a cooled receiver and condensed.

A solution is made by dissolving 160 grains of potassium bromide in two ounces of water, to which one troy ounce of Bromine is added.

It is then stirred for some time and water is slowly added to make the whole four ounces. For internal or external use it should be diluted with water.

Its salts, the bromides, and hydrobromic acid, are commonly used in medicine.

Therapy—The agent uncombined is but little used. It was originally believed to assist metabolism like iodine, and investigations were conducted in that line. In all cases of dyscrasia it was used, but was finally abandoned. It was used universally during the war as an application in **hospital gangrene**, and was sometimes given as an internal antiseptic.

The general effects of Bromine is that of a nerve sedative and antispasmodic. Its influence on the circulation of the nerve centers causes a marked reduction of nerve force. This characteristic influence is exercised in all the compounds of

Bromine, modified, of course, by the therapeutic influence of the substance with which it is combined, producing characteristic properties permanent in the individual combination.

BROMIDES.

Potassium bromide. Dose from ten to thirty grains.

Sodium bromide. Dose from ten grains to one drachm.

Lithium bromide. Dose from five to twenty grains.

Calcium bromide. Dose from five to thirty grains.

Ammonium bromide. Dose from two to twenty grains.

Strontium bromide. Dose from five to thirty grains.

Ferrum bromide, Ferrous bromide. Administered in the form of a syrup.

Syrup of the Ferrous bromide. Dose from ten to forty minims.

Zinc bromide. Dose from one to two grains.

Aurous bromide. Dose, from $\frac{1}{100}$ to $\frac{1}{16}$ of a grain.

Character—The compounds of Bromine with the alkaline earths are isomorphous compounds—white granular crystalline solids, readily soluble in water, sparingly soluble in alcohol. They exhibit in more or less of a modified form, as has been said, the characteristic properties of the Bromine.

Physiological Action—The effect of the bromides in large doses, upon the animal economy, is that of universal depression similar in many ways to that of gelsemium, but not as quickly induced and more permanent, as inorganic salts are by no means as quickly eliminated as organic remedies. Repeated and continued doses of the former are usually necessary to induce the characteristic phenomena, although sensitive patients exhibit them after comparatively small doses. There is slowly progressive paralysis first of the motor and finally of the sensory nerves. There is paralysis of the voluntary muscles with trembling and uncertain gait, with ultimate inco-ordination. Muscular contractility is abolished more or less completely.

The capillary contraction finally induces an extreme inefficient capillary circulation, with a marked and characteristic pallor. There is an interference with metabolism and with the oxidation of the blood, which results in more or less complete anæmia.

There is a characteristic fetor of the breath and an eruption on the skin, at first simple or papular, then similar to acne and finally pustular, ulcerative and suppurative, becoming furuncular in character.

The bromides are eliminated with every secretion, but so slowly that in the doses usually prescribed there is accumula-

tion of the salts in the system from excess of ingestion over excretion. These have been found in the urine nearly forty days after the administration of the remedy had ceased.

Specific Symptomatology—The direct indications for the use of the bromide are nervous excitement, nervous paroxysms from irritation, exalted nerve action from temporarily increased nerve force, fullness of the capillary circulation, and a marked determination of blood to the nerve centers.

In anæmia, in atonicity relaxation or flaccidity of the general muscular structure, the bromides are contra-indicated.

Therapy—They are applicable in all forms of **nervous irritation**, with or without spasm, but they should be given in conformity with the specific symptomatology.

Spasms of a general and also of a local character, with cerebral fullness or fullness of the nerve centers, congestive nervous irritation are relieved by the bromides.

In acute **cerebral, spinal** or cerebro-spinal **inflammation** the bromides are indicated because of their direct influence upon the vasomotor system. In the delirium of fevers with their condition they act promptly. Their influence is greatly enhanced by combination with ergot, where the capillary circulation of the brain is very full.

The Bromides are in constant use to anticipate or control **convulsions**, their antispasmodic influence being constant and reliable. Whether the spasms are infantile, hysterical, puerperal or epileptiform, the Bromides can be given according to the indications named, usually with good results.

The Bromides have been more generally prescribed in **epilepsy** than any other agent. It is in these cases that their physiological influence has been studied, as the condition known as bromism has been often induced. Brown-Sequard's formulæ for the treatment of epilepsy were at one time widely used. The following was the one used for children from eight to twelve years of age:

R̄—Potassii Bromidi	-	-	-	-	ʒi
Ammonii Bromidi	-	-	-	-	ʒiiss
Potassii Iodidi	-	-	-	-	ʒi
Potassii Bicarbonatis	-	-	-	-	grs. xl
Spt. Chloroformi	-	-	-	-	ʒiii
Infusi Columbæ	-	-	-	-	ad. f. ʒvi

M. Sig. Take two drams morning and noon, and three drams at night, freely diluted with water. When the convulsions are reduced in number or cease entirely, the size and frequency of the dose is diminished. It is sometimes given only when the paroxysms can be anticipated.

He advises the substitution of the infusion of digitalis instead of cumbo when the heart is feeble or when there is general weakness.

The writer admonishes adherence in these cases to the rules herein laid down as indicated for the use of the Bromides, and their avoidance when so contra-indicated, as far as possible.

In cases of epilepsy where the indications are plain and the influence of these agents seems to be beneficial, it is sometimes necessary to keep the patient under their influence for some months, and sometimes for a year or two, notwithstanding certain unpleasant cutaneous results. Very small doses at long intervals will often keep up the good results.

In cases resulting from injury or from organic lesion, no permanent results are likely to be obtained.

Potassium bromide is given with good results in **whooping cough**, in paroxysmal asthma, in vomiting of pregnancy and in irritative or reflex bronchial cough; also in reflex palpitation and in some forms of cardiac neuralgia and in gastrodynia.

In irritation or **irregularity** of the **heart's** action from the above causes, the bromides are directly indicated. The usual heart tonics, such as digitalis and cactus, will increase the disorder. In rapid heart from irritation of the sympathetic, we have had this fact confirmed in a remarkable manner.

Lithium is the remedy to assist in tissue metamorphosis and in the elimination of urea, the urates and uric acid. Consequently in **lithæmia**, when there is nervous excitement, irritation or spasm, where the blood is loaded with these substances, the bromide of lithium will be the most serviceable. It works specifically upon the kidneys, soothing irritation and stimulating functional activity. Although the Bromides are often advised promiscuously in **rheumatism**, the lithium bromide is the indicated remedy—generally because of the condition named above.

In **delirium tremens**, in **hysterical mania**, **nymphomania** or **satyriasis**, or in other forms of irritation of the sexual organs with excitement, the Bromides are certain in their action.

In **sexual hyperæsthesia** so evidenced with excessive determination of blood, potassium bromide is the remedy. The effect of this agent in removing sexual feeling and diminishing sexual power and the power of erection, is due to the permanency of its influence in inducing capillary contraction, producing a local anæmia.

The bromide of sodium acts nicely in **insomnia** from nervous excitement and overwork of the brain, overstrain of the nervous system.

In the administration of morphine per orem or opium in any form, the nausea and excitement, and in some cases dangerous phenomena apparent in patients, women of a nervous temperament with disordered stomach, often attributed to idiosyncrasy, are sometimes entirely overcome by administering the agent with small doses of the bromides. The most desirable influ-

ence of the opium salt is obtained. This is especially true where there is gastric hyperacidity.

STRONTIUM BROMIDE.

Synonym—Bromide of Strontium.

Formula— $\text{SrBr} + 6\text{H}_2\text{O}$.

Character—Colorless, odorless, deliquescent crystals, of a bitter saline taste. Soluble in about its weight of cold and in half its weight of boiling water.

This agent has been more recently introduced into therapeutics and is believed may take the place of the bromide of potassium, with none of the unpleasant influences induced by full doses of the potassium salt. The Strontium salt if perfectly pure is in every way innocuous. It has a field of action wider than the alkaline bromides. It is a gastric, intestinal and heart **sedative** of much value, and with no undesirable influence.

Therapy—It takes the place of alkaline agents in the treatment of **disordered digestion** with a sedative influence added.

Germain-Sée reports a series of thirty-two cases of **dyspepsia** in which the condition was in all cases promptly ameliorated. Some of these were suffering from dilatation. Several of them have been cured. M. Sée calls special attention to the fact that from the beginning there was "a notable diminution of gases." The bromide of Strontium, he said, "acted against both the acetic and lactic acid fermentations, and especially against the gases of decomposition." M. Sée exhibited the bromide of Strontium in daily quantities of from two to four grams, divided into three doses and administered with meals. His clinical tests were made with the bromide of strontium. He concluded his report to the French Academy in the following words: "It produces no distressing effect upon the stomach, even when given in elevated doses, and it may even be taken in quantities of four grams (one dram), maximum, with each meal."

AMMONIUM BROMIDE.

Occurrence—The Bromide of Ammonium is obtained as the result of the chemical reaction between hydrobromic acid and aqua ammoniæ and the carbonate of ammonium in solution. The product is evaporated and crystallized.

Character—A transparent, colorless, crystalline body, forming in prismatic crystals, or a white powder, finely crystalline.

It has no odor, but a salty, acrid, pungent taste. It is permanent in the air. It is soluble in water, one and one-half parts, and in thirty parts of alcohol.

Administration—The dose is from two to twenty grains, and it is given in solution in syrup or elixir. A dose of ten grains may be repeated every two hours.

Specific Symptomatology—This agent is a nerve sedative when the cerebral or nervous excitement is due to exhaustion, feebleness and overworked condition of the nervous system. It is the most active of the stimulating sedatives. It will exalt the enfeebled nerve force by its stimulating influence, and by the soothing influence of the bromine the irritation is relieved, the excitement is quieted and restful sleep will follow.

Therapy—It is an excellent remedy when the nerve sedative is needed in asthenic conditions. It improves the enfeebled, irregular and **irritable heart action** under these circumstances and increases the pulse. It lacks much of the depressing influence of the other bromides upon the heart. It will more quickly irritate a sensitive stomach than the others. In erratic **sensual excitement** from exhaustion or over-indulgence; in **spermatorrhœa** with sudden spasms of sexual excitement followed by complete relaxation, feebleness and coldness of the parts, this is a temporary remedy. Tonics must be given with it. It will control undue **nocturnal excitement** and emissions, during the recovery from the use of tonics. It is not a good remedy to persist in, in any case. It is the best of the bromides for epilepsy when there is feebleness and lack of capillary fullness in the nerve centers—a tendency to anæmia of these centers.

AUROS BROMIDE.

Synonym—Bromide of Gold.

Formula—AuBr.

Description—A greenish or grayish yellow micaceous powder, insoluble in water. At temperatures above 239 deg. Fah. it decomposes into gold and bromine.

The **bromide of gold** has been used extensively by Goubert and others in the treatment of **epilepsy**. When given in full doses there was no evidence of bromism, although its influence upon the motor area was as pronounced as that of the alkaline bromides, producing extreme relaxation and relief in a number of cases. Dose, from $\frac{1}{100}$ to $\frac{1}{16}$ of a grain.

BROMOFORM.

Synonym—Tribromethane.

Formula— CHBr_3 .

Occurrence—This analogue of chloroform is formed by the action of methylic alcohol upon bromine in the presence of potassium hydrate.

Character—A colorless limpid liquid, with an odor and taste suggesting chloroform. It is sparingly soluble in water, freely so in alcohol and ether. Crystallizes on cooling to 16 deg. Fah.

Physiological Action—It is a motor depressant of much activity. It has produced death in a few cases, and in several cases it has produced collapse, with depression of the heart and respiration, great muscular relaxation, coldness of the skin and extremities, cerebral congestion and contraction of the pupils.

Therapy—It is an **anæsthetic**, but has not been generally used for that purpose as yet. It has a depressing influence upon the vaso-motor system, but does not actively depress the heart. It is antispasmodic to a marked degree. It is an antiseptic and analgesic.

It has been extensively advised for some years in the treatment of **whooping cough**. Considerable literature has accumulated on its influence. Stepp and Lowenthal originally experimented with it in several hundred cases and reported excellent results. Their observations were that it reduced the paroxysms in number, severity and duration; that vomiting quickly ceased and that hemorrhage, if present, became quickly controllable. It promoted sleep, and the night coughing was less frequent and less severe. The benefits were observed usually in from three to five days; in severe cases, in one week.

It is in quite common use among prominent regular physicians in the treatment of this disease. Some are enthusiastic in its praise and others are apathetic.

The following method for the preparation of an emulsion of Bromoform is advised:

R̄—Bromoformi,	-	-	-	-	-	-	-	3i
Tinct. Tolutani,	-	-	-	-	-	-	-	3ii
Syrupi Tolutani,	-	-	-	-	-	-	-	3i
Mucil. Acaciæ,	-	-	-	-	-	-	-	3iv
Aquæ Menth. virid.,	q.	s.	ad.,	-	-	-	-	3iv

Mix the Bromoform with the tincture of tolu and add gradually to the mucilage and syrup, previously mixed in the bottle. Shake vigorously and dilute with the spearmint water. Dose, from one-half to one dram.

AMMONIUM VALERIANATE.

Synonym—Valerianate of Ammonium.

Formula— $\text{NH}_4\text{C}_5\text{H}_9\text{O}_2$.

Description—It occurs in quadrangular whitish or colorless plates, with a pungent, sweetish taste, and with the odor of the acid. It is readily deliquescent in the air and is soluble in water and in alcohol.

Administration—It is given in doses of from two to ten grains. Five grains may be given for a sufficient time in syrup or elixir.

Physiological Action—The Ammonium Valerianate paralyzes the spinal cord in lower animals, and reduces nerve force in all cases in overdoses. It is an active sedative of the stimulant type, similar to the bromide of ammonium, but with a wider field. It is more palatable and more acceptable to the stomach. In combination with the bromides it produces very satisfactory results.

Therapy—This agent was once a panacea for "nervousness." It is popular among nervous women with hysteria—an enfeebled condition with hyperexcitability, and it is prescribed for its specific soothing and nerve strengthening power during pregnancy, when the nervousness is a most troublesome symptom, preventing sleep at night, and rendering the wakeful hours miserable. It is given at the menopause for this condition, and for the heat flashes complained of at that time.

HYDROBROMIC ACID.

Formula—HBr.

Occurrence—Prepared by treating phosphorus under cold water with bromine and distilling the liquid. Squibb prepares it by acting on a hot solution of bromide of potassium with sulphuric acid.

Description—Hydrobromic acid is a colorless gas, fuming strongly in the air, is readily soluble in water, forming a solution of the acid with properties similar to hydrochloric acid.

The solution of hydrobromic acid gas in water produces the liquid acid of pharmacy. It is a colorless liquid with the characteristic properties of a mineral acid. The official acid contains about ten per cent of the gas.

Administration—It should be given in from fifteen to thirty drop doses, diluted, every two hours, until the condition is much improved, when the doses may be given farther apart and other treatment resumed.

Specific Symptomatology—In conditions where a nerve sedative is demanded and where there is a deficiency of normal acids, evidenced by a thin, red, dry tongue, long, narrow and

pointed, with red mucous membranes, with the conditions hereafter named, Hydrobromic Acid is indicated.

The symptoms for which this agent will be found specific are: Wild, erratic and unpleasant dreams, constantly present when the patient is asleep, for a few days preceding actual delirium; face flushed, pupils dilated, increasing dullness with disinclination to consecutive thought. This is followed by mumbling and incoherent talking in the sleep, which rapidly increases as the fever increases, to extreme dullness and coma, with the characteristic accompaniments, constant muttering, picking at the bed-clothes, involuntary discharges, etc.

Therapy—The writer has not been able to find any agent which will take the place of this remedy under the conditions above named in the **delirium of typhoid fever**. It is true beyond cavil that if the delirium of any fever is kept in abeyance and the mind is kept clear, all other conditions are very much more amenable to treatment. Experience has taught us that this is so important that in severe cases of delirium other treatment at times must be suspended until this result has been accomplished.

In these cases if there be widely dilated pupils, and especially if the enteric symptoms are marked, ergot in ten drop doses will greatly assist its action.

In nervous wakefulness, present in some fevers, or where the patient is terrorized by a seeming inclination to fall from great heights as soon as he falls into a doze, the sleep disturbed by frightful dreams, the agent is specific. This condition sometimes follows the administration of quinine and opiates in conjunction. A single dose of fifteen drops of dilute hydrobromic acid will often be followed by a refreshing night's sleep.

The action of this agent in general is identical with that of the bromides of sodium and potassium, except that the proportion of bromine present is much less, and to produce the marked effects of bromine, doses sufficiently large to produce gastric irritation must be given. It is therefore not a remedy for epilepsy, but it has a field of action in which it greatly exceeds the alkaline salts.

HYDROCYANIC ACID.

Synonym—Prussic acid.

Formula—HCN.

Occurrence—Hydrocyanic acid in full strength is not used in medicine. It is the most poisonous of all the acids. Its fumes inhaled in small quantities may produce sudden death, if at all concentrated. It is a transparent, colorless, exceedingly volatile liquid acid. The process of its preparation is entirely different from that of the dilute acid.

It occurs free in nature in the bark of the wild cherry tree, and in the bark or stones, leaves and flowers of the almond, peach, cherry, plum and other trees.

HYDROCYANIC ACID DILUTE.

Synonym—Dilute Prussic acid.

Occurrence—The officinal acid is made by combining potassium ferrocyanide, sulphuric acid and water in proper proportions in a retort and heated in a sand bath, the contents conducted into a cool receiver containing distilled water. It is also more readily prepared from the cyanide of silver instead of the potassium salt. It is kept in cork-stoppered, amber-colored bottles, in a cool place. It decomposes in glass or rubber-stoppered bottles. It contains two per cent only of the concentrated acid.

Description—It is a colorless transparent liquid with a pleasant odor of peach kernels, and an irritating and acid but cool taste. It is wholly volatilized by heat. It has no pronounced acid reaction. It is exceedingly poisonous and should be tasted and smelled with great care.

Administration—The dose of the acid should not exceed three drops, although four drops is considered the maximum dose.

Five or ten drops in a half of a glass of water, a teaspoonful given every hour or two for a short time will produce good results. The dose should be frequently repeated because of its evanescent effect. One and two drop doses are often given.

If the patient is taking too much the evidences are tightness in the region of the stomach, weight on the top of the head and dizziness or faintness. It should be promptly discontinued when these symptoms appear.

Toxicity—In full toxic doses the influence of hydrocyanic acid is almost immediate. The patient gasps, struggles and becomes convulsed and falls. The face becomes purple, the eyes are open and staring; the teeth are tightly shut and froth exudes from the mouth. The heart continues to pulsate rapidly, in some cases after the respiration has ceased.

In smaller but poisonous doses the heart becomes slow, the respiration labored, the face more slowly cyanotic, and there is mental disturbance. This may be followed by vomiting, complete unconsciousness; muscular spasm of the local groups of muscles, resulting in involuntary defecation, spasmodic and quickly relaxing erections of the penis, collapse, and death quickly following. If life is prolonged to thirty minutes hopes of restoration are entertained, as the volatile character of the agent causes its rapid elimination. Recovery takes place rapidly if at all.

Antidotes—If time permits the rendering of assistance, immediate stimulation is essential. Ammonia inhaled cautiously and given internally is the most convenient agent. Artificial respiration is usually impracticable because of the disintegration of the blood corpuscles in the capillaries of the air cells. Chlorine gas inhaled and chlorine water internally are chemically antagonistic. Hypodermic injections of atropine and allied stimulants are resorted to, and hot applications and a hot bath, or alternate hot and cold effusions, have been serviceable. Antol claims the nitrate of cobalt to be antagonistic. The carbonates of ammonium, calcium or potassium are internally valuable, the first affording stimulating as well as chemically antagonistic properties.

Physiological Action—The influence of the agent upon the nervous system is that of a sedative and antispasmodic—a characteristic muscular relaxant, acting upon the motor areas of the spinal cord, influencing the terminals of the motor nerves, and thus the muscles. In sufficient doses it produces sedation of mental and nerve action, cutaneous anæsthesia of the extremities from paralysis of the nerve endings, vertigo, mental dullness and stupor, from which the patient may be ultimately aroused and may recover. It slows the heart and induces a feeble, irregular and finally rapid pulse, with a fall of the temperature. The breathing is labored and irregular, and finally rapid and shallow, the oxygenation of the blood being greatly impaired. There is a cold perspiration and great muscular weakness.

Specific Symptomatology—The agent is a nerve sedative to local nerve irritations. It relieves **reflex nervous irritation**, it relieves physical irregularities of nervous origin. It is advised in the reflex **vomiting of pregnancy** and reflex vomiting induced by pain or local injury.

Therapy—It relieves reflex **cough** with much promptness, and controls headache dependent upon remote conditions. Its antispasmodic and soothing influence and its local anodyne effects give it also a wider field. It is a remedy for **spasmodic cough** of all kinds—**whooping cough, asthma** and irritable condition of the bronchial tubes and air passages; also for the irritable cough of **phthisis** and in prolonged **bronchial irritation**. It is a common ingredient of cough mixtures.

In the vomiting of pregnancy other local causes of reflex irritation must sometimes be removed before the full effects of the agent are observed. In one case of persistent vomiting where the patient's life was endangered by its violence, the agent was given persistently with no effect. The writer then cautiously dilated the external os uteri and the cervix, overcoming restrictions and pressing out all the rugæ. The vomiting then persisted until hydrocyanic acid was again administered, when it ceased at once permanently.

It acts specifically as a **gastric sedative**. It controls pain and distress in the stomach when due to a hyperæsthetic condition of the mucous lining of this organ. It relieves many forms of **persistent vomiting**. It has been given more generally for this than for any other one condition. It is a remedy for **pain** in the **stomach** resulting from local irritation, and in nervous excitable patients or **neurasthenics**, persistent **nervous vomiting**, and in reflex vomiting of phthisis pulmonalis. In the **nervous regurgitation** of food of hysterical and neurasthenic young women it is directly indicated.

It is prompt in its influence upon **angina pectoris**, although not as valuable as amyl nitrite or nitro-glycerine. For its immediate effects in this condition it should be given in full medicinal doses and the effect of every dose watched. It is a remedy for irritable and **irregular heart** from increased nerve force or over-stimulation. It soothes and quiets its action and any existing pain. It is useful in the **tobacco** and the **cigarette heart**. In **difficult breathing** from disturbance of the heart's action, or from nervous irritation in the lungs or in the bronchial mucous membrane, it is of much value.

It is applied externally in pruritus, especially in **pruritus vulvæ** of nervous patients, and when this annoying condition is reflex during pregnancy, the internal use of the agent at the same time is important. It is useful applied to a variety of itching skin diseases and has been used in **urticaria**, **erythema** and **eczema**.

ETHYL ACETATE.

Formula— $C_2H_5C_2H_3O_2$.

Synonym—Acetic ether.

Occurrence—Acetic ether is made by combining rectified spirits, sulphuric acid, acetate of sodium and the carbonate of potassium. This mixture, after having stood a while cold, is distilled.

Therapy—Its action is similar to that of ether, but it is not extensively used. It is a most profoundly **stimulating antispasmodic**. Its inhalation produces anæsthesia slowly, but it is too irritating for general use. The writer has had a few cases of prolonged **convulsions**, especially in **children**, where all well-known antispasmodics failed, and the convulsions persisted. He has given five, ten or fifteen drops of acetic ether, in water, and repeated the dose in half an hour or an hour. In every case the convulsions were promptly controlled, seldom another spasm occurring.

ŒNANTHE.**ŒNANTHE CROCATA.****Synonym**—Water Dropwort.**Part Employed**—The root.**Natural Order**—Umbelliferæ.**Locality**—Europe.

Botanical Description—*Œnanthe crocata* is a perennial aquatic plant with a fusiform, fleshy, succulent root, indigenous to France and Spain, and found growing in marshes and wet places, flowering from June to September; stem erect, eighteen to thirty feet high, cylindrical, hollow, containing a yellow juice; leaves twice or thrice primated, large, deep-green; leaflets oval-cuneiform, serrate; flowers white, arranged in umbels, with long rays, twelve to thirty in number; style erect, with thickened lateral ribs, and six oil-tubes in each hemicarp; seeds oval, oblong, with persistent style; root composed of many hinge-like branches, resembling beets, containing a white, milky juice, becoming yellow on exposure; taste sweetish, acrid; solvent, alcohol. Dose, one-half grain. The root should be gathered when the plant is in flower.

CONSTITUENTS—An acrid emetic principle (resin), essential oil.

PREPARATIONS—Specific *Œnanthe*. Dose, one-twentieth to one-half minim.

Administration—The profound influence of this agent upon the nerve centers is quickly observed. It must be given in minute doses. Five drops of the specific medicine in three, four or even six ounces of water will be found sufficient. Fluid extracts or ordinary tinctures are not to be prescribed, because of uncertain strength.

Physiological Action—*Œnanthe crocata* is extremely poisonous, and from its resemblance to common garden parsley has frequently caused death in men and animals. Toxic doses cause burning heat in the throat and stomach, with disturbance of intellect, cardialgia, nausea, vertigo, violent convulsions, furious delirium, or profound sleep; loss of sight, hearing and speech; rolling of the eye-balls upward, feeble pulse, abolition of sensation and of motive power, with increasing intellectual dullness. There are universal chills, rose-colored spots on face, breast and arms; lividity and swelling of the face, with trismus and bloody froth from mouth and nostrils, stertorous breathing, coma, death.

Autopsies performed on patients dead from the accidental use of this agent have shown an engorgement of the blood vessels of the brain and cord. There was effusion of blood and bloody serum in the occipital foramen. The sinuses of the dura mater and the veins of the pia mater also were distended with blood, as were also the sinuses of the vertebræ.

There were apoplectic foci in the cerebral mass. There was serous effusion in the cellular tissue beneath the arachnoid, in the ventricles and at the base of the brain.

Therapy—The agent has acquired a reputation in the treatment of **epilepsy**. It has cured a few violent cases and very many cases of *petit mal*. Fisk reported five cases cured, and other trustworthy investigators have had similar results. It is indicated in those cases in which, instead of fullness of the capillary vessels of the brain and spinal cord, there is anæmia of these organs more or less marked. This distinction was made by Henning, and is an important one.

It has proved of value in cases where epilepsy has resulted from injury, in cases where there is impairment of the brain structure and imperfect cerebral circulation with impairment of the nutrition of the brain.

SOLANUM.

SOLANUM CAROLINENSIS.

Synonym—Horse nettle.

Part Used—The plant and the root.

Natural Order—Solanaceæ.

PREPARATIONS—Tincture Solanum. Dose, from twenty to sixty minims. Specific Solanum, made from the root. Dose, from five to twenty minims.

CONSTITUENTS—Solnine, Solanine, Solanidine, Solanic acid.

Therapy—The remedy has been used with some success in the treatment of **epilepsy**. It was used in an Eastern hospital for epileptics experimentally, with a reduction in the number of paroxysms of twenty-five per cent. It may be given in all forms of epilepsy in sufficiently frequent doses to produce a sensation of dullness or drowsiness. It has cured some stubborn cases and has relieved many. Its specific field is yet to be determined.

It has been used in the treatment of **puerperal convulsions** with satisfactory results, in a few cases. In hysterical paroxysms it has been useful.

GUARANA.

PAULLINIA SORBILIS.

Synonym—Brazilian Cocoa.

Part Employed—The seeds.

Natural Order—Sapindaceæ.

Location—Brazil.

PREPARATIONS—Extractum Guaranæ Fluidum. Fluid Extract Guarana. Dose, five to thirty minims.

Extractum Guaranæ. Extract of Guarana. Dose, three to ten grains.

Specific Guarana, from one to fifteen minims.

CONSTITUENTS—Caffeine, Tannin, Volatile Oil, Saponin, Resin.

Botanical Description—A woody, climbing vine, with erect, smooth, angular stem; leaves alternate on long stalks, with two pairs of leaflets; inflorescence in erect spicate narrow panicles, pubescent, about four inches long; flowers small, white, borne on interterminal panicles loosely arranged on thick small rachis; fruit about the size of a grape, of a pyriform shape; seed usually solitary, about the size of a hazel nut, roundish and pointed, of a shining purplish brown color.

The seeds are roasted by the natives and ground coarse in a mill, and the shells removed. The mass is moistened, rolled into rolls and dried for the market. It forms a chocolate brown mass. It is made into a tea or beverage, and is a common and highly prized drink over the greater portion of South America, especially east of the Andes.

Physiological Action—In its influence it is a tonic and mild nerve stimulant and sedative. Gaurelle, who first called attention to it, mentioned it as a most useful tonic in protracted convalescence. He had great confidence in it in persistent diarrhœas, especially those of phthisis. Others have used it successfully in chronic diarrhœas.

Therapy—The fluid extract of this agent, given in doses of from ten to thirty minims, has been used specifically in the treatment of **headaches**, other than those due to actual disease of the stomach, as from catarrh or ulceration or cancer. In many forms of headache, and especially the form due to functional gastric derangement, known as "sick headache," it is certainly a serviceable agent.

CHAPTER V.

AGENTS USED TO INDUCE GENERAL AND LOCAL ANÆSTHESIA—
ANÆSTHETICS.

CHLOROFORM.	ETHER.	NITROUS OXIDE.	ETHYL BROMIDE.
COCAINE.		EUCAINE.	MENTHOL.

CHLOROFORM.**Formula**— CHCl_3 .**Synonyms**—Formyl chloride, Trichloromethane.**Occurrence**—Formed by the saturation of a common organic radical, CH with three volumes of chlorine. This is a derivative of the first of the paraffine series of hydrocarbons.

It was originally prepared by the following process, which is still authorized: Recently slacked lime, chloride of lime and water are mixed together and alcohol is slowly added. The temperature is quickly raised when the chloroform distills over. The fire is withdrawn. The crude distillate is purified by exposure to sulphuric acid. This is then mixed with alcohol and potassium carbonate and again distilled.

It is also made by the decomposition of chloral hydrate and by the distillation of acetone with chlorinated lime. This latter method is now the common source of production.

Description—It is a heavy, colorless, volatile liquid with a pleasant, ethereal odor and a sharp, pungent, sweet taste; soluble in alcohol and ether, but sparingly soluble in water. It will dissolve fats, resins, gutta serena, certain alkaloids, phosphorus, iodine and other substances insoluble in water or other solvents. It is unstable in the light.

Although not inflammable, when combined with alcohol, it will decompose with the evolution of free chlorine, producing a characteristic green flame, quickly vitiating the atmosphere by the irritating influence of the chlorine.

It decomposes also in gas light and by the liberating of chlorine and the production of irritating compounds from the constituents of the gas, produces great respiratory irritation. This must be remembered in its administration.

It is a solvent for oils and alkaloids and is thus a valuable menstruum under important circumstances.

It was discovered simultaneously in the United States, in France and in Germany in 1831. Its anæsthetic influence was soon observed, but it did not come into general use until 1847.

Physiological Action—Chloroform taken internally in sufficient quantity is an irritant poison. Being insoluble and easily diffusible, it produces intense local effects rapidly.

It is an irritant and vesicant. Its influence when confined and evaporation prevented, is profound. It produces intense burning pain with subsequent slight anæsthesia. Taken into the stomach it produces pungent warmth, burning and, finally, gastric irritation. In conditions of gastric pain with flatulence it induces increased peristaltic action, relieves the pain, causes expulsion of the flatus and acts as an antispasmodic.

When inhaled its influence is that of a sedative. If given in small quantity with an abundance of air, there may be a little hysterical excitement, but the patient quickly falls into an apparently natural sleep. The pulse becomes round and full. The respiration becomes slower and regular and the face is slightly flushed.

If increased to an excessive amount the face becomes pale, the breathing becomes irregular, heavily stertorous and labored, and may cease suddenly. The cheeks are puffed with the expiration. The heart's action becomes rapid and feeble, and the appearance is alarming. If the symptoms are not vigorously combated death may occur suddenly.

Therapy—When first discovered it was believed to be able to fill an important part in therapeutics. It was given internally in spasmodic conditions, often with good results. It was used in whooping cough and other spasmodic coughs, in asthma, in hysteria and in spasmodic pain. Its influence by inhalation so quickly overshadowed all other influences that its internal use was neglected. It is useful, however, internally in the above-named conditions and in hiccough, angina pectoris, biliary and nephritic colic and in simple acute painful conditions. From half a dram to a dram internally, largely diluted, will produce a certain amount of anæsthesia similar to its inhalation, although not so profound.

Its antiseptic influence renders it serviceable in fermentation and decomposition in the stomach, and a few drops taken in water stops many forms of **nausea** and **vomiting**. Five to ten drops on a lump of sugar will hold in check many cases of **sea sickness**.

It is valuable in its external influence. It will relieve **neuralgic pains**, **lumbago**, **sciatica** and many conditions where a local irritant is not contra-indicated. If the anodyne influence of the agent, in its external use, can be obtained without its irritating effects, its field is greatly widened. It is then applicable to **painful swellings** and **local inflammations**—to **rheumatic arthritis** and to inflamed joints. It is often combined in liniments with other anodyne remedies, such as aconite, belladonna, opium, camphor and menthol.

This is accomplished to an extent by using it in the form of a spray when local anæsthesia results. Combined with menthol and sulphuric ether in the spray, it will be sufficiently anæs-

thetic for the opening of boils and abscesses, for the extirpation of superficial growths and for various minor operations.

General Anæsthesia—The science of surgery owes its development to the introduction of anæsthetics. The growth of surgery for all purposes, except to save life alone, has been most rapid during the past forty years. Plastic surgery, abdominal surgery, pelvic and other surgery for the relief of deformities and for the cure of existing chronic conditions, have all had their birth and development in that time. General anæsthesia has been the greatest boon to the human race. It is not necessary here to detail the application of anæsthesia to specific surgical conditions.

The administration of chloroform is demanded in all cases of severe **pain** not relieved by other anodynes, and in all **painful operations**; also in convulsions as an **antispasmodic**, in the **convulsions** of strychnia and other convulsive poisons, and to an extent in the convulsions of **cerebro-spinal meningitis**, **tetanus** and **hydrophobia**. In violent **convulsive coughs**, in **reducing dislocations** and setting **fractured bones**, in **nephritic** and **renal colic**, in the pains of **labor**, in reducing **strangulated hernias**, in hysteria and angina pectoris. In convulsions from whatever cause the administration of chloroform is advisable in the careful judgment of the physician. In **puerperal convulsions** there is often no other apparent recourse. In the convulsions of childhood and infancy it is seldom needed, as the list of efficient antispasmodics, for internal or hypodermic use, is now great, and one or more is usually on hand. These are usually more permanent in their effects than anæsthetics. In the spasms of **epilepsy** its use is often demanded, if no more than for temporary relief.

In **violent chorea**, especially the malarial form, severe and intractable to the usual methods of treatment, chloroform given for a short time at intervals of from three to six hours, will modify the severity of the movements. In **whooping cough** a few drops may be held in the hand to the child's nostrils, and will modify the paroxysm. In violent coughs of a reflex origin chloroform is of much benefit.

Special Administration—The use of chloroform by inhalation for the production of profound anæsthesia far overshadows all its other uses. It has been in constant use since 1847, when it was introduced to supplant ether. It is agreeable, speedy, profound and in every way convenient, and does not produce the disagreeable after-effects of ether. The opinion of many careful administrators is that it is probably as safe as ether in safe hands, but that it demands absolutely expert administration.

If entrusted to students, or inexperienced newly graduated physicians, or self-confident isolated physicians with limited experience, who do not appreciate the extreme danger and re-

sponsibility, it is a dangerous agent. The apparent mortality from its use is much greater than that of ether, but this is undoubtedly due to faulty administration. The agent produces a profound influence upon the respiratory centers and upon the heart, and this effect is often obtained suddenly. There are usually evidences of its approach which are quickly observed by an experienced administrator and avoided or successfully combatted.

In its administration the physical condition of the patient must be fully considered. If there be any quantity of albumen in the urine, if there is diabetes mellitus, weak heart, with insufficient valvular action, or if there are dropsical conditions of the heart or thorax, it must be avoided for protracted operations, and given with greatly increased care for minor or short operations.

In the preparation of the patient, the stomach should be empty, the neck entirely free from any tight bands, the clothes should be open and loose to obtain unrestricted circulation and respiration, and the patient should have unquestioned confidence in the administrator.

He should be kept in a horizontal position and in no case should the agent be administered in a sitting posture, especially when operations involving the nerves of the face are contemplated.

Three methods of administration have been adopted. One contemplates the concentration of a small amount of vapor and the exclusion of nearly all air. It will produce sudden anaesthesia, and can be well managed, but must be exceedingly dangerous in careless hands. The common general process is to administer from one-half to one and one-half drams on a folded cloth or in a holder calculated to admit a full volume of air.

Esmarch's method, now almost universally adopted by clinical surgeons, is the use of a thin gauze spread over a wire frame which lies loosely over the mouth and nose. On to this the chloroform is dropped—drop by drop—slowly but continuously, the patient breathing through the gauze. There is no concentration of the vapor and there is a free admixture of air. This produces no previous stage of resistance or excitement, but few if any untoward symptoms appear, the after results are not unpleasant, and the amount of agent necessary to be administered is greatly lessened.

Restorative Methods—During the administration, the pulse and respiration are constantly watched, and any variations from normal carefully observed, and if at all conspicuous the agent must be discontinued and restorative methods adopted. The pupil contracts at first, but if danger appears it dilates. The use of the nitrate of amyl inhalation, the injection of brandy, strychnine, digitalis, nitro-glycerine or carbonate of ammonium

solutions will usually restore the pulse if failure is apparent. If respiration stops, the patient should be inverted, and artificial respiration persistently applied for at least an hour, with flagellation or hypodermic stimulation. Orificial surgeons claim to have restored many patients by the dilatation of the anal sphincter.

The Laborde method of tongue traction, when adopted, has produced excellent results, and should be well understood. It consists of traction on the tongue from its base, steadily and rhythmically, imitating in time the normal respiratory movements.

The free use of strychnia for a day or two before the administration of chloroform, with a single hypodermic of morphine at the time, is a common custom. This is believed to prevent shock, to avoid after emesis and to permit of more ready anæsthesia with a less quantity of the anæsthetic.

Anæsthesia in Labor—In no condition is chloroform administered with so much assurance, with so little anticipation of serious results and with so much satisfaction to the patient, as in **labor**. In these cases, if the usual care be taken, no unpleasant results occur. There is a record of a few deaths having occurred since its introduction, but the percentage is infinitely smaller than in any other class of operations. It is in every way superior to ether because of the pleasantness of its administration and lack of after effects.

The dangers from its use are in producing too complete anæsthesia early in the case, or in the expulsive stage, paralyzing the involuntary muscular fibers and preventing proper contraction and subsequent involution, thus promoting post partum hemorrhage. There is another danger and that from administration when the patient is in a semi-recumbent or sitting posture. Its paralyzing effects on the heart may be quickly induced between the pains, but if pain recurs at once, injurious influences will be overcome. The writer has thought that the safety of the agent in labor was due to the antagonizing influence of the regularly recurring severe pains. If serious symptoms suddenly appear they can be overcome by lowering the head and inducing a recurrence of the pain.

In the second stage of labor a few breaths of dilute chloroform vapor taken just as the pain approaches, will often produce great relief with no apparent effect upon the consciousness of the patient. Many physicians allow the patient to hold a folded handkerchief in her hand on which a few drops have been poured and to administer it herself on the occurrence of the pain. This is a careless habit and should not be tolerated. When the pains are abnormal, cutting, aggravating and irregular in character, an increased quantity of chloroform will often change them quickly to normal.

It will dilate a rigid os and promote general relaxation of the parts, will encourage diaphoresis by overcoming nervous irritability, and will promote the labor in a kindly manner. It is seldom that complete anæsthesia is essential except in complicated cases, or in cases of primiparæ where there is slow dilatation of the external parts, in the expulsion of head, or in instrumental cases. In these, complete anæsthesia need not be maintained for a great length of time. The physician is censurable who refuses from prejudice to use chloroform in severe cases, or when indicated in labor.

ETHER.

Synonym—Sulphuric Ether.

Formula— $(C_2H_5)_2O$.

Description—A light, limpid, transparent, colorless liquid with an intense unpleasant odor and a sharp, acid, burning taste. Its specific gravity is 0.72 and its boiling point is only 94 deg. Fahr.

It crystallizes at -24 deg. Fahr. It is exceedingly volatile, and its vapor is highly inflammable and explosive when mixed with air. It is soluble in water and in alcohol. It is an excellent solvent of many substances, some not otherwise dissolved.

Occurrence—Ether is made by the decomposition of sulphuric acid and alcohol. Five parts of alcohol and nine parts of strong sulphuric acid are mixed in a vessel in a cold water bath, and this mixture with a small stream of alcohol is conducted to a retort, heated in a sand bath to 280 deg. Fahr. The chemical processes are such that the sulphuric acid acts upon the alcohol, forming *sulphovinic acid* and water. This newly formed organic acid, in its turn, acts upon another molecule of alcohol, forming ether and sulphuric acid.

Physiological Action—When inhaled, ether causes an increase in force and frequency of the pulse and sustains for a while the heart's action, while chloroform depresses it. It depresses the respiratory centers and irritates the respiratory tract, but this influence is not so immediately dangerous; hence its general use as an anæsthetic. If the respiratory centers are not paralyzed it will sustain its stimulating action on the heart often through a prolonged and profound anæsthesia.

Ether is a common and comparatively safe anæsthetic. It produces local anæsthesia, also, by the abstraction of heat. Internally it is an active poison, although less so than chloroform. Death occurring more slowly, there is more time for the administration of restoratives. Artificial respiration and the application of electricity to the spinal centers and to the respiratory muscles are the available means of restoration.

For anæsthetic purposes ether is thought to be safer than chloroform, but its slowness of action, its irritating influence upon the respiratory tract, the prolongation of the stage of excitement and the subsequent discomfort, the disagreeable stomach and head symptoms, are all so objectionable that they overbalance the danger from chloroform. With careful, confident surgeons, however, chloroform usually has the preference.

Administration—General anæsthesia was discovered through the use of ether. Its administration is conducted similarly to that of chloroform, except that the vapor is kept more confined. It produces a preliminary stage of excitement, with flushed face, succeeded by pallor. A larger quantity and more time is necessary than with chloroform. It often induces violent vomiting, which is protracted during the recovery from its influence. During its administration the pulse and respiration should be closely watched. Slow, shallow or irregular respiration must be quickly observed and the agent withdrawn until the respiration is increased in strength—if necessary, by artificial means. Irregular action of the heart must have the same care, but with ether the respiratory symptoms are likely to appear first. It is used in all cases where a general anæsthetic is needed, they need not be enumerated.

Ether has an unusual influence in reducing the temperature. The reduction in extreme cases amounts to nearly four degrees, and it is seldom less than two. The patient must be prepared for so marked a reduction, as it may increase the shock and lessen the power of the system to react from the shock after the operation. Every precaution should be taken to conserve the body heat.

The vapor of ether is inflammable, and it must be administered with great caution where there is danger of ignition.

Therapy—Internally ether has a sweet, pungent taste. It produces a sensation of warmth in the stomach and acts as a stimulant and a narcotic. It has been used in **spasmodic colic**, in bilious and nephritic colic, and in neuralgic or other pain in the stomach and in the intestines. It relieves flatulency. It stimulates gastric and intestinal secretion and increases peristaltic action. It is given in **angina pectoris**, in **spasmodic asthma** and in **heart failure after prostrating disease** or **after hemorrhage**. Its influence, although prompt, is so transient that other stimulants either replace it or are used with it. Its hypodermic use as a stimulant has the objection of being liable to produce abscess.

Injected deeply over the main nerve trunk, it has cured persistent neuralgias, especially sciatica. A few drops of pure ether are used in the injection, which may be repeated after twenty-four or forty-eight hours.

Ether spray applied to the surface is a local irritant and anæsthetic. Its inherent influence is enforced by the freezing

effects of the extreme cold induced by its rapid evaporation. It has long been in use in minor surgical operations. Amputations have even been performed under its local influence. It is used in this manner for **neuralgias** and local pains. The restoration of the tissues after the freezing is often quite painful.

NITROUS OXIDE.

Synonyms—Laughing gas, nitrogen monoxide.

Formula— N_2O .

Description—A rather heavy gas, colorless and odorless, but with a sweetish taste. It is one and one-half times heavier than air. It is soluble in water; 100 volumes of water will dissolve 78 volumes of the gas. At a pressure of 30 atmospheres, and at a temperature of zero Fahr., it becomes a colorless, mobile liquid, which, if dissolved in the bi-sulphide of carbon and evaporated in a vacuum, will produce a temperature of -220 deg. Fahrenheit. It is a very unstable liquid and explodes readily. This gas will sustain respiration and support combustion. It was discovered by Priestley in 1776, and was used as an anæsthetic by Wells in 1846. It is obtained by the distillation of the ammonium nitrate.

History—The general anæsthetic properties of this gas were discovered by Sir Humphry Davy in the latter part of the last century. It was first used by Wells, of Connecticut, in 1846. For fifty years the agent has been in constant use as an anæsthetic where profound results are desired for a brief period only.

Physiological Action—If serious results occur there are short, frequent and shallow respirations, quick pulse, stertorous breathing and cyanosis. But few deaths have ever occurred from its use. It causes cerebral engorgement and a consequent rise of arterial pressure. It is therefore contraindicated with those who are predisposed to apoplexy or those advanced in years who are thought to have atheromatous degeneration of the walls of the blood vessels.

It has no irritant properties. Its peculiar influence in inducing extreme hilarity when inhaled in small quantities has given it the name of laughing gas. When taken in full quantities this effect is not apparent.

Therapy—The method of administration is to close the nostrils and cause the patient to take long, deep inspirations of the gas through a tube in the mouth. The anæsthesia is immediate and complete and consciousness returns suddenly with but few unpleasant effects. It is in general use only by dentists, although serviceable in many minor surgical operations.

Nitrous Oxide gas has been combined with oxygen gas and

with ether and chloroform to determine if possible an improved method of anæsthesia. Its combination with oxygen is advised for anæsthesia in anæmic and debilitated patients suffering from heart or lung disease, in elderly patients, in patients suffering from obstruction in the naso-pharynx, in patients that are very susceptible to the Nitrous Oxide alone. The combination is slower, more permanent, and less depressing in its influence than the Nitrous Oxide alone.

ETHYL BROMIDE.

Synonyms—Bromethane, hydrobromic ether.

Formula— C_2H_5Br .

Occurrence—This substance was originally obtained from the action of bromine upon alcohol in the presence of amorphous phosphorus. A simpler method and the one commonly adopted is to decompose the bromide of potassium with sulphuric acid, during which process alcohol is slowly added.

Description—It is a volatile liquid, neutral, colorless, of an agreeable odor, similar to chloroform, and of a sweetish, pungent, hot taste. It is unstable in light and in the air, and should be kept cool and in dark glass bottles thoroughly corked.

It is slightly soluble in water, but freely soluble in alcohol and ether. It burns with a green flame, emitting bromine vapors.

It must not be confounded with the bromide of ethylene, which is a dangerous chemical substance not in use in medicine.

The agent is a general anæsthetic.

Physiological Action—The agent acts similarly to chloroform, but is more transient in its influence. It slows the pulse and respiration and reduces the blood pressure.

Hamecker showed that it influenced the inhibiting power of the nervous system over the respiration. Applied to the lower animals he caused a complete stoppage of respiration and apparent death often from twelve to fifteen minutes before the heart would cease to beat.

In its administration therefore, the respiration must be closely watched, especially after the agent has been continued for some time. It is administered freely, but its influence should not be prolonged, because the longer continued the more apparent is its depressing influence upon the respiration. A dram should be applied on a cloth and its full vapor inhaled quickly.

Anæsthesia is sometimes induced by a very few full deep inhalations and as quickly passes off without unpleasant effects.

It seldom produces vomiting or vertigo, but it leaves an unpleasant taste in the mouth similar to garlic, and the odor of the breath is persistent for some hours.

Therapy—It has been used freely in many localities for general anæsthesia, and it is highly spoken of. If the pure drug be used it is exceedingly safe, only a comparatively few deaths having occurred from it. It is used to the best advantage in minor operations, in short operations and in dentistry.

Certain operators are enthusiastic in its praise, as the anæsthetic in labor, claiming that its transient influence controls the pain without producing unconsciousness, and that there is no relaxation of the uterine muscular structure to permit post-partum hemorrhage.

It must be used as cautiously as other general anæsthetics, but when once well understood it has a place between nitrous oxide gas and chloroform, which is important.

COCAINE.

COCAINE HYDROCHLORATE.

The alkaloid of *Erythroxylon coca*, a white, bitter, crystalline substance soluble in water, ether and alcohol, when acted upon by hydrochloric acid forms Cocaine hydrochlorate.

This salt in common use is dispensed as Cocaine. It is a white, transparent, permanently crystalline powder, odorless and bitter, and produces, first, tingling, then numbness to the tongue. It may be used hypodermically, usually in one, two, four or ten per cent solutions.

Physiological Action—Its internal use produces a sense of exhilaration. It stimulates the brain, the muscular and mental powers are temporarily increased and a sense of power and endurance is experienced. This is followed by lassitude, depression and melancholy. Its local application produces anæmia and coldness of the part to which it is applied, followed by an entire suspension of sensation. Its paralyzing influence upon the nerve terminals is rapid and is conveyed upon the nerve filaments toward the nerve center.

In its application to the eye and exposed nerve endings in decayed teeth, or in the gums for the extraction of teeth—in localities thus near the brain serious results often occur, and sudden deaths are by no means infrequent even when two per cent solutions are used. Although it has but little influence upon the skin intact, it acts quickly upon the mucous membrane and upon the conjunctiva. It is in common use in ophthalmic practice and by nose and throat specialists. Unpleasant results occur to all who use it, but by experience they learn promptness in combating its influence.

Therapy—It is *par excellence* the great **local anæsthetic**. It is in any dose a dangerous agent, and this fact confines its use to minor operations, where but a small quantity need be used.

If the danger element in the introduction of larger quantities could be eliminated, nearly all of the minor operations and a large per cent of the major operations could be performed with local instead of general anæsthesia.

In all cases where its diffusion can be retarded and its influence confined to the locality in which the operation is to be performed, larger operations are possible with a smaller quantity of the agent.

Corning, of New York, in 1887 and 1888, performed thigh amputations and joint resections and abdominal operations with good results by restricting the diffusion of the agent.

It is used, as stated, in all minor operations. In **amputations** of the fingers and the toes, in **incisions** and small **excisions**, in stricture of the urethra, which is very susceptible to its action, in phymosis, and, although very dangerous, in the extraction of teeth.

There is authority for the belief that many of the unpleasant effects of the hypodermic use of Cocaine can be prevented by introducing a drop or two of the one per cent solution of nitro-glycerine with each injection of Cocaine. An objection to the use of Cocaine is that surgical wounds do not heal quite as readily where it has been used.

Schleich's "Infiltration method" of local anæsthesia is devoid of danger, and promises excellent results to those who have patience in conducting the method and are not too anxious for general anæsthesia. This method presumes injection *into*, not *beneath* the skin. The solutions contain a very small proportion of Cocaine and morphine, and the local effect is supposed to be due to compression of the capillaries and nerve filaments by the infiltration. The point of a fine hypodermic needle is inserted into the structure of the skin and a drop or two of the solution injected. It produces a wheal which soon becomes anæsthetic. Into the outside border of this wheal another insertion is made, and this leaves another wheal following on the outer edge of each wheal. In the line of the incision to be made the wheals are formed by frequent injections, until an anæsthetic line, circle or area is produced which retains the anæsthetic for nearly half an hour with the introduction of a minimum amount of Cocaine.

Schleich has applied the same method to the periosteum successfully and operated upon the bones. He advises solutions made in three strengths as follows, the first being strong for severe cases and the last being relatively weak for simple operations.

Solution:	I.	II.	III.
Cocaine Hydrochlorate, -	gr. iv	gr. ij	gr. 1/5
Morphine Hydrochlorate, -	" 1/2	" 1/2	" 1/10
Sodium Chloride, -	" iv	" iv	" iv
Sterilized Distilled Water, f. drams iv	f. drams iv	f. drams iv	f. drams iv

To which a five per cent solution of carbolic acid is added.

Parvin states that in opening abscesses, extracting teeth, ligating hemorrhoids, operating for prolapse of the bowel, phimosis and paraphimosis, operations upon the vagina and uterus, amputation of the breast, removal of vascular tumors, curetting or cauterizing lupus, partial resection of various bones, as the tibia, clavicle, sternum, ulna, humerus or femur—all these and many other operations may be done by Schleich's method with comparatively no danger from the poisonous effects of the drug.

Cocaine is popularly used to relieve **hay fever** by spraying it into the nose, but the danger of its too free use must be kept in mind. In nasal hemorrhage, whether accidental or incidental to the operation, it has restrained the flow of blood in a few moments by its influence in producing anæmia. This effect is obtainable in all hemorrhages from mucous membranes, and has won for the agent a reputation as a hemostatic.

In all cases where Cocaine is incorporated in ointments it should be remembered that the salts of Cocaine are insoluble in fats, while Cocaine proper is fully soluble and makes a superior ointment. In pruritus vulvæ it will give quick relief locally applied; in vaginismus, however severe, it removes the difficulty temporarily. In rigid os in labor, with dry and hot vagina, a suppository of Cocaine will often correct the entire condition and relax the os completely. In the urethral spasm after labor, with retention of urine, a few drops of the two per cent solution, although not unattended with danger, will often correct the difficulty.

The danger of establishing a pernicious habit of using the drug is infinitely greater from the use of Cocaine than from the use of coca. Notwithstanding this fact it is often prescribed internally.

Samayoa prescribed it in small medicinal doses internally for the treatment of **smallpox**, and made the following observations, which, if true, are important:

"Cocaine, given continuously from the beginning, can completely abort the disease.

If given after the eruption has appeared, it will transform the confluent or hemorrhagic forms into the discrete.

Sometimes when the Cocaine is given from the beginning of the disease the eruption assumes a corneal aspect, and the pustules collapse before the usual time.

Cocaine prevents suppuration, hence there is no secondary fever and no pitting.

To obtain these results it is necessary to give the Cocaine as soon as the initial symptoms appear, and it must be continued without interruption."

The best preparation is the hydrochlorate, and it should be continued five or six days, and even nine if necessary.

EUCAINE.

Comprising two preparations placed upon the market: Eucaïne A and Eucaïne B, intended as a substitute for Cocaine.

Synonyms—Eucaïne A. (Methylbenzoyl tetramethyl oxy-piperidin carbonic acid methylether.) Eucaïne B. (Benzoyl vinyl diacetone alkamine.)

Description—Both substances stand in close chemical relationship to cocaine, and are obtained by a complex series of chemical reactions. Eucaïne A is a white crystalline powder, soluble in 10 parts of water. Eucaïne B is also crystalline, soluble in 27 to 28 parts of water, more easily soluble in hot water.

It has marked **local anæsthetic** properties. It is more of an irritant, as it induces a local hyperæmia, instead of the local capillary contraction and anæmia induced by cocaine. Its influence upon the central nervous system is not so immediately pronounced, hence its greater safety. It is fully as toxic as cocaine internally if given in sufficient doses, but a larger dose is required to produce the same serious results. The antidotes are the same. The agent is applied in two, four and ten per cent solutions, extemporaneously prescribed as ten, twenty or forty-eight grains to an ounce of distilled water. It is somewhat slower in action, and its influence remains longer than that of cocaine. It is used in the eye, in the nose and throat, and for all purposes where cocaine is advised. In local inflammatory conditions, the capillary contraction and anæmia induced by cocaine is often of great advantage. In this particular it is superior to Eucaïne.

Used after the manner of Schleich in infiltration anæsthesia Eucaïne produces pain, and has not, as yet, proved as satisfactory as cocaine. It is said Eucaïne does not decompose like cocaine by boiling, and its solution may be thus sterilized without deterioration.

MENTHOL.

Formula— $C_{10}H_{19}(HO)$.

Occurrence—A stearopten deposited from the cold oil of Japanese and Chinese peppermint. In varying proportions it is found in the *Mentha piperita*, *Mentha arvensis* and *Mentha Canadensis*. Chemically speaking it has the character of a secondary alcohol.

It has been known in Japan for twenty centuries, but only came under general observation in English speaking countries in 1879.

Description—It crystallizes in the form of prismatic crystals, almost colorless, somewhat resembling the crystals of the sulphate of magnesium, or rather talc. It is bulky, one ounce filling a two-ounce bottle. It is soluble in alcohol, ether, chloroform and oils, but sparingly soluble in water, to which it imparts its taste and odor readily.

It has the odor of peppermint, although lacking its pungency, and a sharp, pungent, aromatic taste, which fills the entire mouth, and remains as a cold, tingling sensation for some minutes after the agent is removed. It is exceedingly pleasant and agreeable in all its influences, and this fact has contributed to its popularity.

Physiological Action—Menthol is said to paralyze the spinal nerve centers, and also the motor and sensory nerve trunks. Its influence upon the terminal nerve filaments is immediate and pronounced, producing a **local anæsthesia**. It produces a sharp, burning sensation, followed by coldness and local insensibility. It is also antiseptic. It is a popular headache remedy and relieves many cases of simple neuralgia. The crystals are compacted into the form of pencils, which are frequently rubbed over the painful locality.

Therapy—In simple neuralgia, in **toothache**, in **various headaches** not of organic origin, it will relieve the pain and permit rest and quiet. It has been of service in severe local **neuralgia**, sciatica and rheumatic pains. It is incorporated in many liniments where an antiseptic and anæsthetic influence is desired.

It is a standard remedy among rhinologists for the treatment of **nose** and **throat disorders**, serving a most excellent purpose in **catarrh** either of an acute or chronic character. In acute **coryza** its frequent inhalation will sometimes quickly terminate all unpleasant symptoms. In **hay fever** it allays the immediate discomfort and retards the progress of the disease by its continued use.

In **asthmatic breathing** of this disorder its inhalation gives satisfactory relief. In fact, any asthmatic breathing may be temporarily benefited by its use with only pleasant results.

Irritable bronchial coughs and laryngeal irritations are also relieved by its inhalation. A spray used with compressed air, and deeply inhaled, produces direct and most satisfactory results in all these conditions named.

It is valuable to allay **itching** and local irritation, especially *pruritus vulvæ*, persistent cases yielding to its influence. In the itching of **eczema** and **urticaria** and other skin disorders it is of service. It may be incorporated into an ointment for application.

CHAPTER VI.

AGENTS WHICH, WHILE TRUE NERVE DEPRESSANTS, EXERCISE A DIRECT INFLUENCE UPON THE REPRODUCTIVE ORGANS—EMMENAGOGUES, ECBOLOGICS, OXYTOCICS, ANAPHRODISIACS, RELAXANTS.

ERGOT.
CIMICIFUGA

USTILAGO.
PULSATILLA.
MISTLETOE.

ANTHEMIS.
TOBACCO.

ERGOT.

SECALE CORNUTUM.

Synonym—Spurred Rye.

Part Employed—The horn-shaped sclerotium of *Claviceps purpurea*.

Natural Order—Fungi.

Locality—Russia.

Botanical Origin—The chief source of Ergot is from rye (*Secale cereale*), a cultivated grain common in many countries, but forming the chief breadstuff in Russia. Rye has a stem four to six feet high; leaves lance-shaped, ten to twenty inches long, rough above; spike four to six inches long, two-sided; spikelet two-flowered; seed oblong, grooved on the upper side, brownish; ripens in July.

Ergot is a fungus (*Claviceps purpurea*) growing in rye and certain other grasses. When rye is in bloom, a sweet, yellow substance, like honey, is seen to cover a few ovaries in some of the heads. This deposit contains innumerable cells, called conidia, and a peculiar sugar, formed from the decomposition of the ovary by the developing fungus. The mycelium, or roots of the fungus, consists of thread-like cells, called hyphæ, with an outer membrane, called the hymenium, and composed of short linear cells—the basidia, which separate the conidia. When this separation ceases the first stage of the growth of the fungus is completed. At this stage the Ergot is invested everywhere by the sphacelium which is purplish-black; and growing from below continues to increase in length, and eventually

forms the sclerotium or ripened Ergot; the sphacelium drying and becoming thinner, falls off or is washed off by the rain. The third stage of growth does not take place till the following spring, and as it completely destroys the medicinal properties of the Ergot it is necessary to collect at the end of the second stage of growth.

Ergot is described as somewhat fusiform, obtusely triangular, usually curved, three-fourths to one and one-fourth inches long, and one-eighth inch thick; three-furrowed, obtuse at both ends, purplish-black, internally whitish with some purplish striæ, breaking with a short fracture; odor peculiar, heavy, increased by trituration with potassium or sodium hydrate test-solution; taste oily and disagreeable. Old Ergot, which breaks with a sharp snap, devoid of pinkish fracture, hard and brittle between the teeth, odorless and tasteless, should be rejected (U. S.). Solvent, dilute alcohol. Dose, five to twenty grains.

CONSTITUENTS—Ergotine, Ecbolene, Ergotic acid, fixed oil.

PREPARATIONS—*Extractum Ergotæ Fluidum*, Fluid Extract of Ergot. Dose, from one-half to one dram. *Specific Ergot*. Dose, five to sixty minims.

Ergot is prepared by special processes of purification for hypodermic injection. Lloyd's Ergot, liquid Ergot and other forms are available, and Ergot so used is immediate in its action and can be so administered when impossible to give it by the stomach. Ergotin in solution in water and glycerine is excellent for hypodermic administration.

Physiological Action—Ergot causes both acute and chronic poisoning when taken in toxic doses. Acute ergotism is characterized by vomiting, purging, headache, dizziness, drowsiness, slowing of the pulse, dilatation of the pupils, dyspnoea, pain in the chest and loins, confusion of the senses, formication, coldness, anæsthesia, convulsions, swelling of the face. Chronic ergotism is characterized by neuralgic pains, formication and numbness of the extremities, opisthotonos, violent delirium succeeded by exhaustion, death occurring in coma or in convulsions; or the drug may affect nutrition; muscular weakness is followed by gangrene of the limbs or superficial parts, which become blackened, shriveled and hard—a dry gangrene, generally ending fatally.

Ergot is classed as a motor excitant by most writers, and yet the evidences, as above described, of its depressing influence upon the nervous system and upon the circulation are most conspicuous. In its influence upon the circulation of the brain and spinal cord, it may be given in sufficient doses to produce anæmia, and that it does greatly reduce the excitability of the nervous system, under certain circumstances, none will deny. It acts in perfect harmony with the bromides when there is acute cerebral engorgement with great nervous excitability.

There is no doubt that it produces contraction of the arterioles, although there are many evidences to prove that it may permit the venous capillaries to dilate freely.

In its influence upon unstriated muscular fiber the action of Ergot is pronounced. It acts upon the muscular structure of the womb, producing extreme tonic or tetanic spasm of the fibrillæ, causing a marked reduction in the size of the organ if enlarged, and rapid emptying of its blood vessels, and consequent anæmia. Many prominent writers believe the anæmia induced, causes the profound muscular contraction. It is more plainly apparent that a peculiar irritating influence of the agent upon such muscular structure induces its contraction, and that such contraction, assisted by the influence of the agent upon the coats of the arterioles, causes them to become emptied to so marked an extent, and thus the anæmia.

Ergot acts upon the heart muscle in much the same manner as upon the muscular structure of the womb, although much less violently. It will surely reduce the size of a hypertrophied or dilated heart.

Because of the profound irritation of muscular fibrillæ and consequent almost immediate contraction induced by Ergot, it is the most active agent known in inducing expulsive pains in labor, in overcoming uterine inertia and in controlling uterine hemorrhage.

Specific Symptomatology—Extreme fullness of the circulation of the brain, flushed face, headache, bright, sharp eyes, great restlessness.

The indications for its safe use in **labor** are: first; uterine inertia; muscular relaxation with a more or less general weakness, second; the first stage of labor must be completed, and the *ostium vaginæ must be fully dilated*.

There must be no obstacle to the free expulsion of the child.

The contractions induced by this agent are not smooth, spontaneous, natural, rhythmical contractions, but are irregular and extreme, and if an overdose be given it may induce a tetanic contraction and a single, most violent, continuous expulsive effort which does not cease until the entire contents of the womb are expelled.

With such an influence, if there be a rigid, undilated os or perineum, or mal-position of the child, or extreme dryness of the parts, serious results, as rupture of the womb or extreme laceration of the perineum, are almost unavoidable.

This profound and continuous pressure on the child and placenta arrests hæmotosis, greatly paralyzes the heart's action, and thus impairs the circulation, inducing cyanosis and often death of the infant before its expulsion is complete.

Again, such pronounced action upon the womb structure

may result in subsequent muscular paralysis, with great impairment of its contractile power, and if there be no post-partum hemorrhage there may be subinvolution more or less persistent. It will be seen, therefore, that this remedy in parturition is a dangerous one, and if used at all it should only be when every contraindication is absent, and every indication present.

Therapy—In **labor**, when there is threatened post-partum hemorrhage, or when the history of previous labors shows a tendency to such an accident, a full dose of Ergot may be given just at the close of the second stage, or after the head has passed the perineum. No harm can come from such a procedure, and it will serve as a positive safeguard. If there is then free hemorrhage and lack of full uterine contraction, the dose may be repeated in perhaps half an hour, but the attendant must be assured that the womb is entirely empty. If the contractions are not firm and continuous, and hemorrhage at all violent should occur, other measures, such as external irritation and compression of the uterine fundus, or the introduction of hot water into the uterine cavity, must be resorted to in addition. Ergot is in general use in **post-partum hemorrhage**. It must be given in doses of from half a dram to a dram of the fluid extract. If this dose be added to an ounce or two of hot water and drank, its influence is more immediate and pronounced.

In the treatment of uterine **subinvolution** or of **chronic metritis**, Ergot is a good remedy. The use of the agent conjointly with the bromide of potassium is especially advised in this condition, and with the further administration of properly selected uterine tonics the cure can be speedily completed.

Polypi are expelled from the uterine cavity by Ergot, and the agent having a specific action upon the substance of the womb, is opposed to **hypertrophy** and to the development of abnormal growths within that structure. **Uterine fibroids** are expelled by Ergot if possible, and if impossible, the persistent internal use of the agent is advised as a means of limiting their growth. Interstitial or submucous fibroids only, are influenced by it. Sub-peritoneal fibroids are apt to be a little outside of its influence, because outside of the range of the contraction of the muscular fibers.

Mammary tumors, from uterine irritation, are slowly reduced by the action of Ergot.

The hemorrhage and excessive discharges, purulent or otherwise, occasioned by the growth of foreign bodies about the womb, will be beneficially influenced by this agent. The growth of a uterine cancer is sometimes retarded a little, and the hemorrhage from the cancer is more or less controlled by Ergot.

In uterine **hemorrhage** at the **menstrual epoch**, menorrhagia, or in metrorrhagia, it is a most valuable agent.

In patients of relaxed muscular fiber its action is very prompt. The dose can be so measured and timed as to reduce the flow to normal time and quantity, while, by the use of other agents, a healthy condition is being secured. Its influence upon the womb structure is at the same time conducive to a cure, acting in harmony with other uterine tonics.

As stated in its physiological action, Ergot is a most useful remedy where there is a constant tendency to fullness of the **circulation** of the **brain**, **hyperæmia**, with flushed condition of the face, with vertigo, nausea and violent headache. In threatened **apoplexy** in young, full-blooded, active men, with full cerebral circulation, it overcomes the immediate symptoms of an attack, and if properly administered will cure the tendency.

Where apoplexy from acute cerebral hemorrhage has occurred, it is a very useful agent in unloading the distention of the capillaries and assisting in the contraction and removal of the clot.

In children, where there has been a **fall** upon the **head**, or a violent blow, with symptoms of **concussion** of the **brain**, Ergot is the most prompt remedy known. It should be given in from five to ten drop doses, and repeated in half an hour if necessary. Spasm should be averted by passiflora, chloral, the bromides, or, a full dose of gelsemium may be given. But the circulation of the brain must be controlled at once by Ergot and its influence sustained by smaller doses until inflammation is no longer pending.

In certain forms of **inflammation** of the **brain** and its meninges, where the capillary circulation is very full, Ergot is most pronounced and certain in its action.

In **cerebro-spinal** meningitis of an acute endemic or epidemic form, it may be given in the early stages of the attack, but should be withheld in the latter stages. Other directly indicated agents should not, however, be neglected for this. It is especially applicable to children in the early stages of acute cerebral or cerebro-spinal inflammation.

Ergot in doses of five drops three or four times daily for a few days will benefit many severe cases of **typhoid fever**, especially if there be an engorged condition of the cerebral circulation, with tendency to dullness, stupor and mild delirium, with high temperature. It directly influences the intestinal canal, overcoming the relaxed and paralytic condition of its muscular structure, correcting diarrhœa, controlling hemorrhage and greatly improving the circulation. An occasional dose of fifteen or twenty minims will sometimes do much good.

In the treatment of both passive and active **hemorrhage**, Ergot is a most excellent remedy. It contracts the walls of the

arterioles, shutting off a full supply of blood and immediately restraining the flow from open vessels. It is thus at once useful in hæmoptysis, in hemorrhage from the mouth, gums, throat or pharynx, and from the stomach and intestinal canal. A local astringent in gastric hemorrhage from ulcer is often better, and also in intestinal hemorrhage in typhoid. It is good practice to give a local styptic alternately with Ergot, where there is a persistent tendency to hemorrhage in these cases.

In **hæmophilia** Ergot is a good remedy. In this condition infants it may be used for a short time locally and internally.

Hemorrhages from about the eye-ball are controlled from its local application, and acute conjunctivitis and phlyctenular ophthalmia will be benefited, if it be used locally and internally in small quantities.

In **hemoptysis** Ergot is prompt and efficient. It need not be given in large doses. Three to five drops, four times daily, will usually restrain the tendency to hemorrhage, and in a free discharge of blood, a ten-drop dose is usually sufficient, or it may be repeated.

In hematuria Ergot is a prompt remedy if from traumatism, or if from active congestion, but gallic acid is usually better in passive conditions, and in conditions due to structural change.

In paralysis of the walls of the bladder after retention of urine, causing over-distention, Ergot serves a good purpose. If hemorrhage be present it is quickly controlled and the muscular atonicity of the walls is greatly benefited.

Ergot is given in **urinary incontinence** when the cystic walls are greatly relaxed, or when there is a mild form of local paralysis.

Ergotin in full doses has quite a prompt influence upon **diabetes insipidus**. It is also useful in **diabetes mellitus**, but is not depended upon alone. In children afflicted with the latter disease it may be given in positive doses for a time, but should not be given continuously.

In that form of **spermatorrhœa** where there is a tendency to fullness of the circulation of the parts, with erratic and spasmodic erections, and undue sexual excitement, the emission quickly occurring after erection, there is no better remedy known than Ergot. It should be given in about twenty drop doses at bedtime, and its influence is increased and a soothing influence upon the nervous system induced by giving it with ten grains of the sodium bromide.

In the treatment of **aneurism**, and of enlarged veins, and of varicocele, Ergot is much used. Its influence is more positive though upon the arterial than upon the venous coats. It is used with good results in hemorrhoids. Bartholow and others have injected it into the dorsum of the penis to contract the veins there and overcome impotency.

CIMICIFUGA.

CIMICIFUGA RACEMOSA.

Synonyms—Black Cohosh, *Macrotys Racemosa*.

Part Employed—The rhizome and roots.

Natural Order—Ranunculaceæ.

Locality—United States, Canada.

Botanical Description—*Cimicifuga racemosa* is a perennial herb, growing in shady woods, and flowering from May to August; stem smooth, furrowed, unbranched, three to nine feet high; leaves large, alternate, dentately compound; leaflets ovate, incised, opposite, one to three inches long; flowers regular, numerous, small, white, in long racemes; sepals white, four-leaved, rounded; petals four; stamens numerous; anthers incumbent; stigma sessile; pistils oval, forming dry capsular fruit; seeds numerous, small, flat; rhizome horizontal, four to six inches long, one inch thick, irregularly bent, surface rough and knobby, with many cup-shaped scars, with numerous quadrangular, brittle and small rootlets, blackish outside, yellowish inside, fracture smooth, pith large, bark thin, odor faint, heavy; taste bitter, acrid; must be collected in autumn and dried in the shade; solvent, ninety five per cent alcohol. Dose, five to thirty grains.

CONSTITUENTS—*Cimicifugin*, volatile oil, tannic acid, gallic acid, gum, starch, fat, sugar.

PREPARATIONS—*Extractum Cimicifugæ Fluidum*, Fluid Extract of *Cimicifuga*. Dose, five to thirty minims.

Tinctura Cimicifugæ, Tincture of *Cimicifuga*. Dose, one-half to one dram.

Specific Macrotys. Dose, one-tenth to ten minims.

Cimicifugin, which possesses all the medicinal properties of the root, is a resinous powder of a dark-brown or yellowish color, a bitter, acrid taste, and slight odor. Dose, one-half to three grains.

Physiological Action—*Cimicifuga* in large doses produces general relaxation, dimness of vision, dizziness, tremors, slowing of the pulse, fall of arterial pressure, vomiting or gastric irritation; it stimulates expectoration and perspiration, causes intense headache and prostration. These phenomena are caused by the action of the drug on the vasomotor centers and the cardiac ganglia. The headache is chiefly frontal; in some persons the drug causes pain in the joints and limbs similar to rheumatism.

An overdose is promptly signaled by the appearance of the characteristic headache, which assumes a bursting, tearing character, with injected conjunctivæ and flushed face. This will abate at once upon discontinuance of the agent.

Specific Symptomatology—**Muscular aching**, local and general, aching pains as from overworked, overstrained muscles,

great muscular aching with chilliness and rapidly increasing temperature.

It is the agent for **hysteria** with flushed face and heat in the head, with restless and nervous excitement and general muscular aching.

Therapy—In the premonitory stage of **acute fevers**, or of acute inflammatory troubles of whatever character, a common symptom is a general tired feeling with aching of the muscles. In these cases there is usually a chill or chilliness, with more or less fever with the aching. One drop of the tincture of *Cimicifuga* every hour will relieve this aching in from six to twelve hours. If given with aconite for the fever and belladonna for the rigors, the time may be reduced to three or four hours. When indicated, its influence upon the nervous system will probably abridge many of the other symptoms.

Through its influence upon the vasomotor centers and upon the nerve ganglia, it has a beneficial influence upon the heart. In **rheumatic carditis** or **pericarditis** it is a sovereign remedy, acting directly in the line of its physiological influence. In neuralgia of the heart—**angina pectoris** and functional **irregularity** of the heart from exalted nerve influence, either alone or combined with gelsemium, it is prompt and reliable, and should be by no means neglected.

Prof. King advised this agent in **coughs**, and its value through its influence upon the nerve centers has been confirmed by many practitioners. It soothes the cough of excessive nerve irritation, and the reflex cough; the irritable cough of acute bronchitis is relieved by it, as it increases bronchial secretions to a notable extent.

It is given by many as a **stomachic tonic**, and it improves digestion by relieving excess of nerve influence over the functional operations of the digestive apparatus.

As a remedy for **chorea** it has become widely popular. Given in fifteen-drop doses of the tincture four or five times daily, it is superior to any other known remedy. Its effects are permanent if the anæmia and other concomitant conditions are correctly controlled by proper medication at the same time. Its sedative, tonic and antispasmodic influences are here fully exercised.

It may be combined with *scutellaria lateriflora*, with valerian or gelsemium, as the indications demand, with superb results. The writer has cured intractable cases by alternating it with minute doses of exalgine.

The characteristic aching pains above described are very constant in **acute rheumatism** and **rheumatic fevers**. *Cimicifuga* is certainly a royal remedy in these cases, and has become universally popular. If the condition be absolutely confined to the joint and does not involve muscular structure, it is not of as much value. The direct indications must be present.

The agent, however, has a specific influence in overcoming lithæmia, and in preventing and curing conditions resulting from an excess of uric acid—conditions existing in the uric acid diathesis. It is therefore of value with auxiliary treatment in acute or subacute rheumatic arthritis with lithæmia.

It will be found indicated in **rheumatic neuralgia**, in **sciatica**, in muscular rheumatism of the chest walls, in aching of the deep muscles of the back, in myalgia, in severe colds, in neuralgia from cold, in rheumatic headache, and in neuralgia of the ovaries; also with women in the intense muscular aching preceding the menses.

Cimicifuga operates directly upon the reproductive functions. In the female it is valuable as above indicated, in **dysmenorrhea** of a congestive character always, and in **amenorrhea**. In these cases aconite will aid its action greatly, if the condition is induced by sudden cold; and *pulsatilla* will do likewise if the conditions be caused by nervous shock or functional irregularity extending over a longer period. *Helonias* may be given with it, if there be weight and dragging in the lower abdominal region. If leucorrhœa be present with the above indications, it is especially valuable. It is valuable to promote uterine contractions, and in subinvolution. In the aggravating rheumatic pains of parturition, or of the later stages of pregnancy, which deceive by closely simulating those of labor in some ladies of rheumatic diathesis, this is positive and prompt.

In **hysterical conditions** of the menstrual epoch, in hypochondriasis or melancholia at these times, with congestive dysmenorrhea with the above indications, it is specific. In puerperal hysteria with great nervous excitement and the above conditions, or with excitable mania or incipient puerperal insanity, it is a most efficient remedy, having a desirable sedative influence on the nerves of the womb.

The agent is excellent in relieving irregular pains and uterine distress occurring during the course of **pregnancy**. It may be given in small doses, and it thus prepares the patient for parturition and undoubtedly contributes largely to a short, easy and uncomplicated labor. The fluid extract, or from two to five grains of the resinoid, is a most efficient *partus accelerator*. It increases the expulsive pains in a regularly intermittent and normal manner, without spasmodic irritation. While the normal pains are increased, all erratic, rheumatic, irregular and nagging pains are relieved. It promotes uterine involution and hastens normal recovery.

In the male it is valuable in **gonorrhœa**, with aching in the bladder and across the kidneys. We prescribe it oftener than any other agent in these cases. It soothes the nervous irritability and materially assists in relieving the active inflammation. We usually find indications for aconite in the acute cases, or

gelsemium where there is irritation with a tendency to spasmodic stricture, or hydrangea where there are sharp, cutting pains in urination; and these properly combined have been our "sure cure" treatment for many years, with mild injections of zinc sulphate, hydrastine, or hydrogen peroxide, all warm, or of warm water alone. It is valuable also in orchitis with its own indications. In spermatorrhea with irritability and considerable sexual weakness and plethora, it will cure when other agents fail, if given in half-dram doses after meals.

Co-operatives—In its action upon the central nervous system *Cimicifuga* resembles ergot and the bromides, and to a certain extent gelsemium, with all of which it will work harmoniously. In its influence upon the muscular system in rheumatism, it acts nicely with colchicum and salicylic acid, and the salicylates, greatly intensifying their influence.

PULSATILLA.

ANEMONE PULSATILLA.

Synonyms—Pasque-flower; meadow-anemone; wind flower.

Part Employed—The herb and roots, collected immediately after flowering, and used while fresh.

Natural Order—Ranunculaceæ.

Location—England, central and southern Europe and Siberia.

Botanical Description—A perennial flowering herb, growing from five to ten inches in height in sandy soil and in open woodlands. The stems are simple, erect and naked, except the floral leaf, or scape, which bears the terminal flower. It flowers from March to May. The flower is solitary, pendulous, bell-shaped, of a dull purple or violet color, with six sepals from one to one and a half inches wide, downy on the exterior. The fruit is numerous, blunt, with silky tails. The radical leaves are on long foot stalks, divided into linear segments.

PREPARATIONS—*Extractum Pulsatillæ Fluidum*, Fluid Extract of Pulsatilla. Dose, from one-half to two minims. Precipitates upon addition to water.

Extractum Pulsatillæ, Extract of Pulsatilla. Dose, one-sixth of a grain.

Tinctura Pulsatillæ, Tincture of Pulsatilla. Dose, from five to thirty minims.

Specific Pulsatillæ, *Specific Pulsatilla*. From five to twenty drops in four ounces of water. Teaspoonful every two hours.

Anemonin. A crystallizable camphoraceous body; volatile, easily converted in the presence of alkalies into anemonic acid. Dose, from one-twentieth to one-fourth of a grain.

The medicinal properties must be extracted from the fresh

herb, as the volatile character of anemonin permits of the rapid dissipation of these properties on drying.

Physiological Action—The agent has a direct influence upon the brain and spinal cord. In toxic doses it produces mental hebetude, dilated pupils, coma, and in extreme cases, convulsions. It lessens general sensibility.

It paralyzes to a mild degree both sensation and motion. It increases, in proper doses, the cerebral functions and imparts tone to the sympathetic system.

In toxic doses it is a heart depressant; it lowers arterial tension, reduces the pulse rate and temperature.

It exercises an influence upon the heart similar to that of cactus, increasing its power, improving the strength and rate of the pulse and slowing the rapid and feeble pulse of nervous prostration.

The influence of full doses of *Pulsatilla*, taken into the stomach and intestinal canal, is that of an irritant. In the mouth it acts like aconite or xanthoxylum, producing tingling, burning and subsequent numbness. It produces a sensation of rawness, and is followed by acid eructations and unpleasant taste. It produces tightness and constriction of the chest, with congestion, chilliness and great weakness. The agent is seldom given in sufficient doses to produce the physiological effects. It operates much more satisfactorily in doses too small to produce such action. It has long been popular with the homœopaths in minute doses.

Specific Symptomatology—**Amenorrhœa**, with mental perturbation, great apprehension of trouble. **Spermatorrhœa**, with fear of dire results. The remedy is especially efficacious when existing disorders of the reproductive organs are a cause of extreme anxiety.

Homœopathic physicians declare fearfulness as an indication, anticipation and dread of calamity, fear of trouble or death, in male patients suffering from sexual excesses, with spermatorrhœa, threatened impotency, prostatorrhœa, with fear of approaching imbecility.

Therapy—Its influence is especially directed to that portion of the sympathetic nervous system influencing the **reproductive organs**. It increases the tone and functional power of these organs, and overcomes irregular, imperfect or deficient action.

It is prescribed in **uterine disorders** which induce melancholia and hysteria.

It has an apparent antispasmodic or nerve-soothing influence, which renders it valuable in **hysteria** and general nervous irritation with convulsive phenomena, in the absence of acute inflammation, blood determination or fever. A few physicians laud it highly in **hysterical convulsions** and in convulsive conditions due to **uterine disorders**.

In **general nervousness** due to chronic uterine disorder, with or without hysteria, with despondency and nervous irritation, Pulsatilla is an excellent remedy. It may be given in doses of one drop, frequently repeated. In deficient, suppressed and **irregular menstruation**, with the above symptoms, it is of rare value. It will quickly promote a normal and regular flow.

It is an excellent agent in small, frequent doses when the mental conditions above named are present **during pregnancy**, with a general relaxed and atonic condition. Its influence in these cases is enhanced by combination or alternation with *cimicifuga*. It certainly improves the general condition and conduces to a normal and easy labor.

In **nervous exhaustion**, with feeble pulse and deficient capillary circulation, cold extremities and a generally relaxed physical condition, it will serve an excellent purpose combined with other nerve tonics, or in conjunction with the directly indicated remedies.

Pulsatilla is a remedy for **nervous headaches**, especially if of the anæmic variety, characterized by pallor of the countenance—the headaches of the menstrual epoch, of pregnancy, and also those of gastric origin with this specific character. It relieves the constipation, enuresis and dysuria of hysteria and pregnancy. It is excellent for the **urinary irregularities** of the pregnant condition, with ammoniacal urine, catarrh, pain, tenesmus, burning or sharp shooting pains. Its influence in this is facilitated by hydrangea, gelsemium or the benzoate or salicylate of lithium.

Leucorrhœal discharges, attended with pain in the loins, weariness, depression of spirits, loss of appetite and general derangement of the nervous system, are also satisfactorily relieved by Pulsatilla taken internally in five-drop doses of the tincture three times a day, and continued for a few weeks.

It is given in **bronchial** and **pulmonary irritation** and in **bronchial asthma**.

It is used in **eruptive fevers**, and in those cases of *measles* in which the eruption produces excessive irritation of the post-nasal cavity, throat and bronchial tubes.

It has been lauded in **rheumatism**, but any specific influence in this condition is not ascribed to it.

In **gonorrhœal epididymitis** or in gonorrhœal **orchitis** the agent may be given with excellent results, especially if there be gleet and stricture. Small and frequent doses are better than large doses. It speedily relieves the pain and nervous excitability.

USTILAGO.

USTILAGO MAIDIS.

Synonym—Corn Ergot.

Part Employed—The fungus, exclusive of chaff.

Location—In all temperate climates of the world.

PREPARATIONS—Fluid Extract Corn Ergot, miscible with water. Dose, ten to thirty minims.

Physiological Action—The ergot of maize or common Indian corn is similar in its properties and in its physiological action upon the central nervous system and upon the capillary circulation of these organs, to those of the better known ergot of rye.

It is, however, not so irritating in its influence, for, while possessing great power, it works in a smooth, even and pleasant, but positive manner. It produces uterine contractions of a perfectly regular, intermittent and safe character, thus possessing a great advantage over the rye ergot.

Therapy—It is a useful remedy in uterine inertia as it does not exercise the irritating influence of the ergot of rye. Its mild influence prevents any possible injury to the child, and it possesses a very small percentage of the oil of ergot, which is supposed to poison the infant. It conduces to **normal involution** and tonic and permanent subsequent contractions, with no increase, but rather decrease, of labor pains. It is also a most efficient remedy in **post-partum hemorrhage**.

The writer has used it to most excellent advantage in metrorrhagia, and especially in the **hemorrhage** from **cancer** of the **uterus**, holding the entire condition in check for a time and greatly relieving the pain.

In the conditions of **chronic uterine hemorrhage** or other disorder in which the ergot of rye is indicated for continued use, this agent will serve all the purposes with none of the dangers of the former remedy.

MISTLETOE.

VISCUM ALBUM.

Synonym—Viscum flaviscens.

Part Employed—The leaves, twigs and bark.

Location—Great Britain, Europe and America.

Natural Order—Loranthaceæ.

PREPARATIONS—Tinctura Visci Albi, Tincture of Mistletoe; from five to sixty minims. Extractum Visci Albi Fluidum, Fluid Extract of Mistletoe; from five to forty minims. Specific Mistletoe. Dose, from one to ten minims.

Administration—The remedy has failed because the agent used was inert, dried and, perhaps, old. The preparations must be made from the green plant, and the dose must be suffi-

ciently large and frequently repeated. In some cases it may be necessary to repeat the dose every fifteen minutes.

Botanical Character—An evergreen parasitic plant, growing in Europe on fruit trees and in America on oak and elm trees. All varieties have much the same medicinal properties.

It is of a yellowish-green color, six to twenty-four inches high, jointed and branched; leaves opposite, obovate or oval; fruit small, whitish one-seeded berry in clusters; flowers in small spikes or clusters, diœcious or monœcious; plant has little odor, but of sweetish and bitter taste.

Physiological Action—Several cases of severe poisoning from eating the leaves and berries are on record. It produces vomiting, prostration, coma, contraction of the pupil, with muscular spasm. In other cases it produces tenesmus, bloody stools, convulsions, emesis, catharsis and death.

Specific Symptomatology—It is indicated where there is a flow of blood to the brain, and frequent headache and flushing of the face. In hysteria, epilepsy and other nervous diseases; in paroxysms of tearing and rending pains, rheumatic and neuralgic, it is a pain subduer of much power.

With the above conditions it is exceedingly valuable in diseases of women, in **amenorrhœa**, **dysmenorrhœa** and as an **oxytotic**. Its influence is, perhaps, more marked in **labor** than when prescribed for any other condition.

Therapy—In its action on the **womb** it is in some particulars superior to ergot. It is a drug capable of producing **intermittent uterine action**, as distinguished from the tonic contractions caused by some other oxytotic medicines.

It exerts its full force on the long muscles of the uterus, acting on the fundus mainly, while the cervix remains soft and uncontracted.

It may be given early in labor to give tone to the contractions; does not act spasmodically, but steadily and for a long time; it is not followed by any untoward effect; does not, like ergot, produce hour-glass contractions; has a tendency to keep the womb contracted after the expulsion of the placenta and attachments; does not act on the circular muscles of the womb; is a safe oxytotic, as the effects can be continued for hours with small doses.

Tascher, in 1892, reported the results of his observations of the action of this agent upon the **heart**. He became convinced that it was an agent of undoubted merit. He has used the fluid extract in doses of from twenty to thirty minims as a remedy for hypertrophy of the heart, with valvular insufficiency, dropsy of the extremities, small weak pulse, dyspnœa, and inability of the patient to rest in a reclining position, and witnessed astonishing relief from this agent when others failed. Under its use in the above named conditions the pulse became full, strong

and regular, the cardiac dyspnœa was arrested, and the patient able to obtain rest in a reclining position. In some cases, when given in large doses, it produced marked diaphoresis, increased flow of the urine and serous discharges from the bowels, results desirable in all cases where dropsy was associated with the disease, and a combination of therapeutic action not readily obtained in any other cardiac tonic.

Its diaphoretic and cathartic action cannot be relied upon in every case, but as a cardiac tonic it is most efficient.

In the latter stages of **typhoid fever**, when the heart's action is weak, rapid and irregular, with a tendency to collapse, given in conjunction with strychnia, the condition of the patient rapidly improves.

ANTHEMIS.

ANTHEMIS NOBILIS.

Synonym—Chamomile.

Part Employed—The flower heads.

Natural Order—Compositæ.

Locality—Europe.

Botanical Origin—Chamomile is a trailing perennial plant, flowering from June to September; stem six to twelve inches long, hairy; leaves pale-green, alternately sessile, with small thread-shaped leaflets; flowers three-fourths inch broad, terminal, solitary, with a convex disk, numerous white, three-toothed rays and yellow disk florets, receptacle chaffy, conical, convex, solid; odor, aromatic; taste, agreeably bitter; solvents, alcohol, water. Dose, fifteen to sixty grains.

CONSTITUENTS—Volatile oil, Anthemene, Antheminic acid, tannin, resin, wax.

PREPARATIONS—Extractum Anthemidis Fluidum, Fluid Extract of Anthemis. Dose, one-half to one dram.

Administration—This agent seems to exercise but little influence in physiological doses. A few drops of the specific anthemis or the German tincture in a glass of water in teaspoonful doses every few minutes or every hour will accomplish good results when directly indicated.

Specific Symptomatology—Severe pain in infants, from simple causes, extreme susceptibility to pain, general hyperæsthesia, subjective, acute, transient, sharp pains.

Therapy—This agent in hot infusion is emetic, a stimulating diaphoretic, and it promotes the **menstrual flow** when suppressed from cold. It is of little importance, in the writer's opinion, as we have so many other agents with wider and more positive action. In suppression of the secretions from **acute cold** it is a useful remedy. If drunk during an alcohol sweat

or Turkish bath, its influence is greatly increased. In **acute rheumatism** it will prove of service.

It is a mild stomachic and general tonic in half-ounce doses of the cold infusion, and it seems to mildly stimulate digestion.

In acute **colic** in infants, with nervous excitability and tendency to spasm, a few drops may be dropped into a half glass of water and a teaspoonful given every ten minutes with immediate relief. In flatulent colic and in colic accompanying diarrhoea, the discharges of a greenish, feculent character with reflex nervous irritation,—increased nervous susceptibility, it is a specific remedy.

In constant worry and fretfulness of very young infants, without apparent cause, it is a soothing remedy of much value. It is excellent during the teething period to allay nervous irritation and soothe pain. In neuralgic pains in children it is useful.

In **hysterical** females its therapeutic influence is similar to that of pulsatilla. It soothes general irritation and quiets imaginary pains, especially if occurring at the menstrual epoch.

It is useful in dysmenorrhœa and in mild cases of ovarian neuralgia. In amenorrhœa with intermittent pains, and sensations of appearing menstrual flow, it is useful. It may be given for the erratic pains and reflex nerve irritations of the last months of pregnancy, the reflex cough and unbearable muscular cramps and twitchings.

TOBACCO.

NICOTIANA TABACUM.

Part Employed—The commercial dried leaves.

Natural Order—Solanaceæ.

Locality—Tropical America.

Botanical Description—The tobacco plant is supposed to be indigenous to tropical America, but is now cultivated in most parts of the world. It has a long fibrous root; stem erect, from four to six feet high, viscid, hairy, round, branched toward the top; leaves sessile, amplexicaul, alternate, about twenty inches long, ovate-lanceolate, acute, entire, waved, pale-green, slightly viscid, hairy, glandular; flowers in loose panicles with long linear bracts, rose-colored; calyx bell-shaped, hairy, viscid, greenish; corolla funnel-shaped, two inches long, border five-lobed; stamens five; ovary conical; fruit capsule one inch long, ovate, opens by two valves at the summit, two-celled, seeds many, reniform, minute, pale-brown, testa reticulate; taste, acrid; solvents, alcohol, water.

The commercial leaves are thinner than in the fresh state, light brown or mottled, friable, mid-rib thick, branching. The

plant is cut in September, allowed to wilt in the sun, then hung up in a drying-house and exposed to the heat of a fire. At first the leaves become wet, then after several weeks become dry, when they are stripped from the stems and packed for market.

CONSTITUENTS—Nicotine, nicotianin, albumen, resin, extractive, gum, citric acid and salts.

PREPARATIONS—Wine of Tobacco. Dose, from five to sixty minims.

Physiological Action—Tobacco is an acrid narcotic poison. Nicotine is second only to prussic acid in the rapidity of its action as a poison, death having occurred within three minutes. In doses of the one-thirty-second of a grain it causes a burning sensation in the mouth, throat and œsophagus. Larger doses cause great debility, salivation, sweating, confusion in the head, contracted pupils, vertigo, faintness, stupor, low pulse-rate, cold hands and feet, severe retching, distressing nausea, breathing oppressed and gasping, sometimes convulsions, and death from paralysis of the heart and respiratory muscles.

Therapy—Although a powerful acro-narcotic, tobacco is not extensively used in medicine. Its action is irregular and not easily manageable. It is prompt in its relaxing influence on involuntary muscular fiber. An ointment made by simmering a dram of tobacco in an ounce of lard freely applied to a **rigid os uteri** will accomplish immediate relaxation in many cases.

Where extreme **muscular rigidity** is present in prolonged parturition, the patient has been advised to smoke a cigar, which has produced prompt general relaxation, with a favorable change in the character of the pain.

A suppository made of tobacco in cacao butter has been introduced into the rectum in cases of **spasmodic colic, fecal impaction** with great irritation, **strangulated** and **incarcerated hernia**. It is also useful in the obstinate constipation of lead colic.

Internally the agent must be used with great caution in those patients not habituated to it, as it is apt to produce toxic symptoms suddenly.

For internal use we have a number of powerful sedatives, relaxants, or motor depressants that will accomplish the good results of tobacco without any danger of poisoning, being readily controllable.

DIVISION II.

Stimulants and Excitants.

CHAPTER I.

NUX VOMICA.	CAPSIUM.	ALCOHOL.
STRYCHNINE.	IGNATIA.	CINCHONA.
STRYCHNINE PHOSPHATE.	COCCULUS.	EUCALYPTUS.
STRYCHNINE ARSENATE.	XANTHOXYLUM.	AMMONIUM PICRATE.

NUX VOMICA.

STRYCHNOS NUX VOMICA.

Synonym—Vomit nut.

Part Employed—The seed.

Natural Order—Loganiaceæ.

Locality—East Indies.

Botanical Description—A medium sized tree, with a short, thick, crooked trunk and numerous strong branches, covered with a smooth ash-colored bark; wood white, close-grained, hard; young branches long, smooth, shining, dark-green; leaves oval, entire, exstipulate, two to four inches long, three to five-nerved, apex acute, shining; flowers white, funnel-shaped, small, in paniculate cymes; fruit, a berry, round, two inches thick, resembling an orange in size and color; rind thin, tough, filled when ripe with a gelatinous pulp, in which one to five seeds are imbedded; seed one inch wide, one-eighth inch thick, circular, flat on one side, concave on the other, with a ridge extending from the center to the edge; soft, hairy, silky luster; inside horny, tough, with a large circular cavity, into which the heart-shaped cotyledons project; inodorous, bitter. Solvent, alcohol. Dose, one-fifth to five grains.

CONSTITUENTS—Strychnine and brucine, united with igasuric acid, loganin.

PREPARATIONS—Extractum Nucis Vomicæ, Extract of Nux Vomica. Dose, from one-eighth to one grain.

Tinctura Nucis Vomicæ. Dose, from two to fifteen minims.

Extractum Nucis Vomicæ Fluidum, Fluid Extract of Nux Vomica. Dose, from one to five minims.

Specific Nux Vomica. Dose, from one-tenth to two minims.

Strychnine.

Description—This most important of the alkaloids of *Nux Vomica* occurs in the form of colorless prismatic crystals, or as a white crystalline powder. It is odorless, but intensely bitter. It can be tasted in 750,000 parts of water. It is permanent in the air, very sparingly soluble in water, soluble in one hundred and ten parts of alcohol and in seven parts of chloroform. Its salts, named below, are in more common use than the uncombined alkaloid, largely because of its insolubility, but it may be given in doses of from one-eightieth to the one-twentieth of a grain. The more soluble salts are in every way preferable.

Strychnine Sulphate. Dose, from $\frac{1}{120}$ to $\frac{1}{15}$ of a grain.

Strychnine Nitrate. Dose, from $\frac{1}{120}$ to $\frac{1}{20}$ of a grain.

Strychnine Phosphate. Dose, $\frac{1}{180}$ to $\frac{1}{80}$ of a grain.

Strychnine Arseniate. Dose, $\frac{1}{200}$ to $\frac{1}{80}$ of a grain.

Physiological Action—*Nux Vomica* and its alkaloid, strychnine, act on the spinal cord and the medulla oblongata, a non-poisonous dose stimulating, and a toxic dose paralyzing them. There is contraction of the arterioles, while the heart is stimulated by a moderate dose. A poisonous dose causes spasm of the muscles of the chest and prevents the respiratory act, with resulting asphyxia. According to the quantity taken, there may be weariness, stiffness in the muscles, soreness and heaviness in the limbs, stiffness of the joints and of the muscles of the chest and of the lower jaw. A larger dose causes violent tetanic convulsions, with brief intermissions, acute sensibility, and death may result in five minutes and usually within six hours. There is contraction of the muscles, resembling trismus, with constriction in the throat, headache, dizziness, with symptoms of asphyxia. There is a leaden color of the skin; breathing is laborious; the pulse is rapid and fluttering, pupils dilated, while the face has a staring expression, with an appearance of fright. The spasms grow less violent as the system becomes exhausted. During the intermission in the spasms the slightest stimulus will renew them. In some cases there is pain—a neuralgia of the spinal nerves—when an attack is accompanied with shrieks of pain, or with dizziness, insensibility and convulsions. Small doses in the corpulent may cause slight creeping sensations in the skin like electric shocks, with involuntary contraction of muscles, with headache, a disagreeable sensation in the head and dizziness. The influence of strychnine upon the great sympathetic is shown in many ways. There is an elevation of arterial blood pressure, an increased vigor to the heart's action, increased action of the sudoriparous glands, with dilatation of the pupils.

In some particulars it resembles the action of electricity in its effect upon the nervous system. There is often a sensation of tingling, a temporary stimulation, a sensation of increased

nerve force, a renewed energy imparted to both voluntary and involuntary muscles.

Specific Symptomatology—Sallow skin, a sallow circle around the mouth, yellowness of the conjunctivæ, a thick, yellow, pasty coat on the tongue, fullness, soreness or pain in the region of the liver, suggest *nux vomica*. It is also suggested by colic due to atonicity characterized by abdominal fullness, *sharp pain at the umbilicus* and a general torpor of the system. These symptoms are more quickly relieved by small doses of specific *nux vomica* than by powerful anodynes, and the relief by this agent is a cure.

Therapy—The indications for the use of this agent are directly in the line of its physiological influence in small doses, especially when there is an impairment of tone of the gastrointestinal apparatus, a general or local atonicity of the digestive organs or organs concerned in these processes. This condition is sometimes induced by reflex influence, apparent in the persistent **vomiting of pregnancy**, the vomiting or **regurgitation of food** present in hysteria, and in the **vomiting of phthisis pulmonalis**, especially occurring in these latter cases after coughing.

The same atonic condition is present with **infantile diarrhœa** of hot weather, in **cholera infantum**, in **cholera morbus** and in **cholera**. In the vomiting of these conditions small doses of *nux vomica* frequently repeated are specific.

In atonic congestion of the spleen or of the liver, existing from malarial influences, with whatever disease manifested, this agent is directly indicated.

It stimulates the digestion and increases the appetite. It is one of the very best, if indeed it is not the best, of our restorative tonics. In all debilitated conditions, in convalescence from exhausting disease and protracted fevers, wherever there has been depression or exhaustion of nerve force, it is the remedy.

In **chronic stomach disorder**, with deficient digestive power and general malnutrition, this agent arouses the nervous system and increases the functional activity of the digestive and assimilative apparatus more satisfactorily than any other known agent.

In **acute heart failure** from any prostrating cause, strychnia is given hypodermically or in conjunction with digitalis. In the prostration following any inflammatory disease of a severe and protracted character this combination is specific, but it seems to be particularly beneficial in the prostration of beginning convalescence **after pneumonia**, especially if there has been abscess or other exhausting complications. Often in these cases there is a tendency to sub-normal temperature and slow pulse; when this is the case there are but few remedies that will act as strychnia, and none will excel it.

In **impotence** due to exhaustion, to relaxation, or atony of the erectile tissue of the sexual apparatus, strychnia in small doses persistently used is an advantageous remedy. The extract of *nux vomica* may be given, but will not work as promptly as the alkaloid. In the **incontinence of urine** of the feeble and aged, and in nocturnal enuresis in childhood from atonicity without local irritation, minute doses of strychnia sulphate will often cure after repeated failure with other remedies. These facts are especially true in plethoric and relaxed cases and in inactive patients.

In uterine inertia from exhaustion or lack of nerve force, this agent excels all others. It increases nerve force, restores the normal contractility of the uterine muscular fibrillæ, and increases the power and number of contractions in a normal manner. It also anticipates and prevents **post-partum hemorrhage**. In cases where hemorrhage has previously occurred it should be given in advance and for a short time subsequently to the birth of the child.

Cases of **vomiting** in **pregnancy** have been controlled by frequently repeated doses of the tincture of *nux vomica*, and the weakness of the stomach in **dipsomaniacs** with vomiting and anorexia are controlled with the agent, which is often rendered more efficient by combination with capsicum.

The influence of the sulphate or nitrate of strychnia is that of a spinal stimulant, pure and simple, with the power of augmenting nerve force to a most desirable extent by increasing the nutrition of the nervous system entire.

Its effects are not alone upon the motor nervous system and voluntary muscles, but upon the sympathetic nervous system as well. For this influence it is best administered hypodermically, in doses of from the one-hundredth to the one-twentieth of a grain.

In **paralysis** of the **aged**, without active inflammation, it is of value, especially if injected deeply into the paralyzed muscles. Wherever paralysis occurs, without inflammatory action, it may be used if there be no structural changes in the nerve centers.

In the early stage of paralysis where rigidity or muscular spasm is present the agent is contraindicated. In fact, it is not to be administered in paralysis, except where absence of central irritation is evidenced by complete relaxation, flaccidity and perhaps tumidity. The more perfect the relaxation the more satisfactory the action of the agent. In these cases the agent should be injected directly into the paralyzed muscles.

In lead poisoning, with wrist drop and other evidence of suspension of nerve influence, with or without lead colic and constipation, this agent exercises a direct influence.

The influence of strychnia to relieve, modify or cure **alco-**

holism is now almost universally acknowledged. It has been but a short time that dipsomania has been considered as it now is, to be an actual nervous disease of the central nervous system with concomitant phenomena—a long train of disagreeable or dangerous symptoms. But since this fact has been recognized, there has been a universal effort made to discover the most satisfactory method of cure.

In 1891 Yarochevski reported a series of experiments on dogs, conducted to determine the antagonistic power of strychnia over alcohol. He gave them alcohol of a strength of 42 to 65 per cent, and produced a staggering gait by the injection of 60 grams and complete intoxication with 90 grams. The alcohol was given for a week and produced considerable emaciation, followed by death. If, however, a hypodermic injection of two milligrams of Strychnine was administered with each dose of 30 grams of alcohol, the latter could be run up to 180 grams without the development of intoxication or symptoms of strychnine poisoning.

On the ground of these experiments the author formulated the following conclusions: Strychnine suppresses the toxic action of alcohol; it enables persons to ingest large quantities of alcohol for a long time without appreciable injurious effects on the organs. The increased doses of alcohol which may be given with impunity, if associated with Strychnine, have a limit—i. e., as soon as the quantity of strychnine necessary to counteract the effects of the alcohol commences to give rise to toxic symptoms. Strychnine is applicable as an antidote in all forms of alcoholism.

Portugalow, of Samaria, reported in 1891 that he cured 455 cases of **dipsomania** with hypodermic injections of Strychnine nitrate. He knew of reliable and specific remedies for two affections only: Strychnine for the various forms of alcoholism and quinine for malarial fever.

He prescribed a solution of the nitrate, two grains to the ounce of distilled water, for subcutaneous injection. He gave from one or two injections daily of from four to eight minims of the solution. Usually ten to sixteen injections sufficed for a complete cure.

Baines investigated the action of the nitrate of strychnia in **surgical shock**. In thirty cases he injected the remedy hypodermically in one-thirtieth grain doses for from two to six days previous to the operation, where its general influence was not contraindicated by irritation of the nerve centers. On the day preceding the operation it was injected every three hours. It was injected before beginning the operation every two hours, and for two or three days afterward. In some of the cases he claimed *an entire absence of shock*. In all others the shock was very mild, and in no case was it severe, and convalescence was

short and satisfactory. In all cases there was no collapse from the anæsthesia, and but little reduction of the force and strength of the heart and no respiratory failure.

Hare advises one-twentieth of a grain of the sulphate of strychnia at the time of the operation, just preceding and subsequently every half hour, treating the conditions induced by the agent symptomatically. We believe it to be better to begin earlier, in order to have the system previously braced, and not be obliged to administer the agent to toxicity just at the time.

It is a direct antidote to **chloral** and is used to great advantage in the earlier stages of **opium poisoning**, poisoning or asphyxia from gas inhalation and chloroform narcosis, and as a restorative to those apparently drowned.

Antidotes—In the treatment of strychnia poisoning, the stomach should be immediately irrigated. The spasms should be met promptly with inhalations of chloroform or amyl nitrate. A strong infusion of white oak bark or tannic acid in water should be given, or the substances can be used in the irrigating fluid. After the stomach is thoroughly evacuated, chloral in doses of from fifteen to thirty grains, with as much sodium bromide, may be given, or passiflora in from two to four dram doses, or large doses of the fluid extract of gelsemium. If the patient cannot swallow, the passiflora or chloral in solution may be injected into the rectum, or veratrum may be injected hypodermically in doses of from ten to fifteen minims. If the spasms increase in severity and in frequency, the result will be fatal. If they decrease in severity, are of shorter duration and occur after increasing intervals, the prognosis is hopeful.

Strychnine Phosphate.

Therapy—The phosphate of Strychnine given in doses of from one-one-hundred and sixtieth to the one-eightieth of a grain combines the stimulating properties of the Strychnine with the nerve building properties of the phosphorus. It is a combination that should be of much value in conditions where it is desired to retain the high point gained by a nerve stimulant, and make the condition thus gained permanent. The use of phosphorus and the phosphates during pregnancy, where anæmia is present or where the nervous system is seriously drawn upon by the nutrition of the foetus, has been observed by many. The use of the phosphate of Strychnine in doses of one-one-hundredth of a grain is commented upon by Dorset. (Annals of Gynecology, Nov., 1897.)

He says a good appetite and a good assimilation are obtained in the general weakness and debility of the anæmic; constipation is relieved, and, in short, the patient is built up and placed in a good condition to pass through the ordeal of labor. The uterus contracts promptly after the second and third stages of labor, and the use of ergot is entirely dispensed with. The often observed chilliness or rigors which, in the majority of cases, follow labor, have been noticed in but few cases. These rigors, so common after labor, little account of which can be found in text-books, are nothing more or less than surgical shock. This is obviated by the prophylactic—Strychnia. He believes that, as phosphorus and Strychnia are remedies used in the treatment of rachitis with good results they are indicated during the gestation of the rachitic fœtus.

A wide field of action is open to this combination, as prostration from real deficiency of the nerve elements, prominent among which is phosphorus, is a common condition among very many, especially among brain workers. The Strychnia lifts the forces up to the normal point, and the phosphorus permanently holds them there by its restorative influence.

Given during the last weeks of **pregnancy** to patients burdened, weak and prostrate from the condition, especially those suffering from nervous exhaustion, it has a most happy vitalizing and invigorating influence. It improves the appetite and digestion, overcomes despondency, relieves constipation and materially builds the patient up, placing her in an excellent condition to pass through the labor nicely. At that time the uterine contractions are normal and subsequent involution is perfect. The patient recovers much more rapidly.

Arseniate of Strychnine.

Administration—The dose is from $\frac{1}{200}$ to the $\frac{1}{80}$ of a grain, usually administered in pill form.

In granules of the $\frac{1}{134}$ of a grain the agent is convenient of administration and prompt in its action.

Specific Symptomatology—Hale says arsenic acts upon the glandular system and fluids of the body, while Strychnine acts upon the nervous system. He advises it where the nutritive and glandular systems are involved to any great extent, with implication of the nervous system at the same time. This is found in paresis or mild forms of paralysis with œdemic tissues; sodden, relaxed muscular structures, with anæmia and tendency to dropsical conditions; great nervous weakness or prostration, with marked blood dyscrasia, chronic glandular induration, chronic ulceration, and the conditions of the mucous surfaces of the intestinal canal following typhus or typhoid fever and dysentery.

Therapy—It is specifically indicated in the debility or nerve failure of the aged, and in the prostrating influence of severe disease in children. During severe fevers it will not antagonize the sedative influence of the antipyretics, but will brace the nervous system against the prostration that will follow when the fever is gone.

It antagonizes vasomotor paralysis in all cases. In spasmodic affections it is valuable. The author has given it persistently with sedative remedies in two severe chronic cases of asthmatic bronchitis and cured them both permanently. It is indicated in a general way where strychnine is indicated, but has a special characteristic tonic influence.

It may be given in the asthenic stage of all prostrating diseases, except during the hours of the day when the temperature is increasing or stationary at its highest point. It strengthens the heart's action, and, like quinine, if given in the intermission of the temperature, or at the time of the greatest remission, it often prevents an increase of the fever and determines a continued lower temperature. It increases or intensifies the action of many stimulating, restorative or antiperiodic remedies.

CAPSICUM.

CAPSICUM FASTIGIATUM.

Synonym—Cayenne pepper.

Part Employed—The fruit.

Natural Order—Solanaceæ.

I locality—West Indies, South America, Africa.

Botanical Description—*Capsicum fastigiatum* is a shrubby plant, two to three feet high, with spreading stems; leaves two to three inches long; flowers, two or three together in the bifurcation; fruit oblong-conical, one-half inch long, one-fifth inch thick, supported by a flattish, cup-shaped, five-toothed calyx, with a red, shining, membranous, translucent pericarp, enclosing two cells and containing flat, reniform, yellowish seeds attached to a thick central placenta. It has a peculiar odor and an intensely hot taste (U. S.). Solvents, alcohol, ether.

CONSTITUENTS—Capsiacin, Capsicin, volatile oil, resin and fixed oil.

PREPARATIONS—*Extractum Capsici Fluidum*, Fluid Extract of Capsicum. Dose, from five to sixty minims. *Oleoresina Capsici*, Oleoresin of Capsicum. Dose, from one to five minims. *Emplastrum Capsici*, Capsicum plaster. *Tinctura Capsici*, Tincture of Capsicum. Dose, ten to sixty minims.

Physiological Action—Capsicum is a pure stimulant and in large doses causes vomiting, purging and inflammation of the stomach and bowels, with dizziness, intoxication and feebleness

of the nervous power. Locally applied, it is a powerful rubefacient.

It produces rapid capillary determination of the blood to the part, and if taken into the stomach it promotes its own absorption and thus continues its further influence through the nerve centers. Belonging as it does to the Solanaceæ, its influence upon the nerve centers, although insidious and not in all its field of exercise readily distinguishable, is nevertheless powerful and most important, demanding its classification among the diffusible cerebral stimulants. It produces an increase of tone and a marked and comfortable sensation of warmth in the entire system, and a glow and sensation of increased nerve influence and more active circulation.

The general or systemic influence is better obtained from the tincture or from the hot infusion, while local stomach or intestinal effects follow promptly upon the administration of the powder.

Its influence upon the circulation is more marked in its local than its constitutional or central effects, although it does influence general capillary tone. It increases the action of the heart only in extreme cases and in large doses. It barely increases the pulse beat, although it materially alters its character and it does not influence the appreciable temperature.

Specific Symptomatology—It is directly indicated in general enfeebled conditions, with impairment of nerve influence. In general atonic conditions, with relaxation of muscular fiber; in plethoric conditions and lethargic affections, with general impairment of tone, with deficiency of functional force, energy or activity—in these conditions, because of its local and general effects, it is markedly different from other stimulants.

Therapy—Its influence upon the nervous system is shown by the fact that in **general paresis**, and in some cases of **paralysis**, local and general of central origin, it has rapidly promoted cures without the use of other agents. In one case after passive cerebral congestion, it was given in strong infusion, and the tincture applied to the paralyzed arm and muscles, and restoration of nerve influence followed in a few days with a generally improved condition of the nervous system.

It certainly deserves a more extended use in these cases because of the possibility of its being pushed to the extreme, without danger of disturbance of function or structure, or impairment or derangement of any organ. It is a harmless agent, however used; if concentrated, local irritation should be avoided.

It has long been combined with tonics, stimulants and general restoratives in seriously impaired nerve tone of the **dipso-maniac**, with results which were ascribed to other agents used. It has an influence in these cases which resembles that of

strychnine, and yet is quite unlike it, although fully as important.

In **delirium tremens** it produces a sedative influence which results in quiet, rest and in some cases deep sleep.

In these cases it is best in hot infusion combined with hot beef-tea or other hot nutritious liquid food. If its use be continued it will replace the alcohol, and in its satisfaction of the unnatural demands of the stomach, will enable the patient, with proper adjuvants, to permanently overcome the taste for liquor. It must be given in conjunction with persistent and concentrated nutrition, and may be combined with hydrastine or strychnine or other nerve stimulants and tonics.

It is also of much service in the treatment of the **opium** and morphine **habits**, and also that of cocaine. It must be pushed to the extreme limit and any local irritant influence avoided. It restores the secretions of the gastric and intestinal glands in these cases most promptly, and by increasing the appetite and digestion it promotes assimilation and nutrition. This wide and important influence always follows its introduction into the stomach for whatever purpose.

In **languid** and **enfeebled** states of the **stomach**, with inactivity of the peptic and other glands, whatever the cause, it is an immediate and direct stimulant. In **atonic dyspepsia** and flatulent colic, in atonic inactivity of the liver and other glandular organs which have a part in the stomach and intestinal digestion, its influence is immediate and most important. It arouses susceptibility of the stomach and increases intestinal peristalsis, proving a most valuable assistant to cathartic remedies.

It is a common ingredient of pills and laxative granules, and it certainly improves the capillary circulation and nerve tone of the entire intestinal tract. Because of this influence it has been given in full doses with admirable effects in general relaxed conditions of the walls of the intestine, in prolapse of the bowel and in many cases of hemorrhoids. It deserves further use in these lines, but to accomplish the best results it must be given in full doses and persisted in.

In the stage of collapse of **prostrating diarrhœas** and of exhausting fevers and in **cholera**, no agent is more efficient. It is useful in yellow fever, in typhus and in some cases of typhoid where there are great relaxation and muscular weakness, where there are sluggishness of the nervous system, torpor and insensibility, low **muttering delirium** and tendency to coma.

In relaxed and **enfeebled** conditions of the **pharynx** and post-nasal membranes, in engorged sore throats not always accompanied with active inflammatory symptoms, it will sometimes cure when other agents have signally failed. This is

especially true if there be a granular condition, with dark colored membranes, or if there be a purple or discolored hue to the mucous membranes, common in some long continued sore throats. It is a valuable adjuvant in the treatment of **diphtheria** and in **phlegmonous tonsilitis**, with sluggish circulation, and also in the sore throat of **scarlet fever**. In these cases it may be used as a gargle and taken internally also. A most serviceable general gargle is made by combining in strong infusion, capsicum and white oak bark—*quercus alba*—and adding to it an active antiseptic, as boric acid or *echinacea*. This can be given for sore throats when no opportunity for specific diagnosis is afforded.

In its general stimulant effect this agent is a valuable one in combination with quinine in intermittents, and also when the latter agent is given as a tonic and restorative. They act most harmoniously in conjunction, and the influence of the quinine is greatly intensified. It is safe to say that one grain of capsicum, combined with three grains of quinine, will produce better **antiperiodic** effects than ten grains of quinine would accomplish uncombined in extreme cases of **ague**, especially if accompanied with general torpor and inactivity of the liver and of the nervous system, as in **malignant intermittents** and pernicious fever.

The writer has often verified this statement. The combined drugs should be given in the intermission, and are best given so that their action is at its height at the time the exacerbation should occur. They may be repeated at the same hours on consecutive days until the periodicity is interrupted, and then in smaller doses as a tonic, with some liver stimulant, throughout the twenty-four hours.

The old Thompsonian No. 6 is made by combining myrrh two ounces, capsicum half an ounce, and dilute alcohol two pints. Of this, from five drops to a dram may be given at a dose, and it produces a most profoundly stimulating influence. It was the main dependence of Samuel Thompson.

The old antispasmodic combination known as the compound tincture of lobelia and capsicum, unfailing with many of the old doctors as an antispasmodic and general relaxant, is made of lobelia, capsicum and skunk cabbage root two ounces, alcohol two pints. It may be made extemporaneously by combining equal parts of the tinctures of the remedies. It is given in from ten drops to one dram, and was relied upon in all **spasmodic affections**, including puerperal eclampsia and tetanus.

The agent is advised in chronic **parenchymatous nephritis**, in pyelonephritis and in pyelitis. Also in **spermatorrhœa**, with general relaxation of muscular fiber, and in impotence. It is an aphrodisiac of some power. It may be combined with phosphorus or *nux vomica* in the treatment of **impotency**. It is

eliminated from the system through the medium of the kidneys, which it stimulates to increased action. It may produce urinary irritation and tenesmus.

It is used somewhat, externally, in the form of plasters, embrocations or in liniments, but it is rather slow in its action upon the skin and is replaced by more active agents. It is a valuable agent, however, in the treatment of chilblains, exceeding many other better known remedies.

IGNATIA AMARA.

Synonym—Bean of St. Ignatius.

Part Used—The seed.

Natural Order—Loganiaceæ.

Botanical Description—A small tree or climbing shrub with long, out-reaching, vine-like branches, cylindrical and glabrous; leaves smooth, pointed, entire, oval, sessile, opposite; nodding, white, fragrant flowers, tubular, in axillary racemes; fruit smooth, whitish, ligneous rind, many seeds in dry medulla; seeds irregularly angular, from one to one and one-half inch long, oblong-ovate, pale-brown, downy and hard, odorless and bitter.

CONSTITUENTS—Strychnine, brucine.

PREPARATIONS—Specific Ignatia. Dose, from one-sixth to one-half minims. Prescribed from five to fifteen drops in four ounces of water, a teaspoonful every two hours. Fluid Extract of Ignatia. Dose, from one to ten minims. Tincture of Ignatia. Dose, from five to twelve minims.

Physiological Action—The remedy presents the peculiarities of nux vomica to a great extent. In its therapeutic action it is prescribed under much the same conditions, but is a milder remedy.

It seems to have less nerve irritating properties and an efficient nerve tonic influence.

Therapy—It is especially applicable to **hysterical females** with nervous weakness from **persistent uterine disorder**.

In **hysteria** the agent is given in small doses where the following specific conditions are present: Dragging pains in pelvis, dysmenorrhœa with uterine colic, sexual apathy, congestive headache, burning on the soles of the feet, reduced general strength. It will increase sexual desire.

In **nervous depression**, from whatever cause, Ignatia in small doses frequently repeated and persisted in will be found an important remedy.

COCCULUS INDICUS.**ANAMIRTA PANICULATA.**

Synonyms—Fish berries, Indian cockle.

Location—India and the Malayan islands.

Botanical Description—A large, branching, woody, twining plant with gray bark; leaves from four to eight inches long, of a pale-green color, whitish below, nearly entire, cordate, ovate, smooth; flowers are small, dioecious, in panicles eight to fifteen inches long, greenish white; fruit in clusters, rupe globular, reniform, one-half inch long, one-fourth inch thick, scanty pulp; thin, brittle endocarp, projecting deeply interior on the concave side; seed reniform, bitter and oily; pericarp tasteless. Dose, from one to two grains.

PREPARATIONS—Tincture. Dose, from two to ten minims. Fluid extract. Dose, from one to three minims.

Picrotoxin—The neutral principle obtained from the seeds.

Occurrence—It occurs in the form of colorless, shining, prismatic crystals, without odor and of a very bitter taste, permanent; soluble in one hundred and sixty parts of cold water, in nine parts of alcohol, readily soluble in ether. It does not react with acids or bases to form salts. The dose is from the one hundred and fiftieth to the one-fiftieth grain. It is used most advantageously by hypodermic injection.

Physiological Action—This agent, in whatever form used, diffuses readily into the blood and acts upon the central nervous system in much the same manner as strychnia. In toxic doses it produces epileptiform convulsions, which alternate from clonic to tonic spasms, and are not characteristically tetanic as the strychnia convulsions are. It differs from strychnia, also, in its action upon the brain, producing drowsiness, stupor, coma and in some cases delirium. In cases where death is not quickly induced there is headache, vertigo, nausea, general depression, mild anæsthesia and inco-ordination, spasmodic twitchings of the muscles of the various parts of the body.

The agent increases the respiratory function. Engorgement of the lungs does not occur. The left side of the heart is only partially emptied and is flaccid. The right heart is found fully distended after death, the action being arrested in diastole. It slows the pulse and increases the arterial tension.

Flies will die from eating the blood of patients poisoned by this agent.

It is eliminated actively through the kidneys and skin. In medicinal doses it has a direct action on the skin, inducing diaphoresis.

Therapy—In minute doses this agent is applicable to the cases in which nuxvomica is a specific remedy.

It is of value in **debility** of the **nervous system** with weakened or suspended nerve action, in **paresis** or in the milder

forms of **paralysis**, in paralysis of the facial nerves, in the tremor of alcoholics. It is valuable also in **paralysis agitans** and in **chorea**.

It is suggested in all **atonic conditions** of the **stomach**, especially if due to lack of nerve power. In **intestinal dyspepsia** with torpor of the mucous glands and general muscular inactivity it is of much value. It will be found an **excellent stomachic** tonic, improving the general tone of the digestive apparatus.

As compared with strychnia it has active tonic properties with less liability of producing nerve irritation. It is advised in **spasms** of the **thick muscles** of the thigh and leg where, from deficient capillary circulation, there are cold skin and cold extremities. It is mentioned by many writers as a specific remedy in **night sweats**, especially those of phthisis pulmonalis.

Like strychnia, it is used as an antidote to morphia and opium poisoning. It is antagonistic to motor depressants.

XANTHOXYLUM.

XANTHOXYLUM AMERICANUM, XANTHOXYLUM CLAVA-HERCULIS.

Synonym—Prickly ash.

Part Employed—The bark and berries.

Natural Order—Rutaceæ.

Locality—United States.

History—The northern prickly ash, *X. Americanum*, and the southern prickly ash, *X. Clava-Herculis*, are agreed upon by botanists as the source of the prickly ash used in medicine.

Botanical Description—The northern prickly ash (formerly *X. fraxineum*) is a shrub six to twelve feet high, covered irregularly with prickles, but chiefly in pairs at the insertion of the young branches; leaves imparipinnate, alternate, sometimes prickly on the back; leaflets in four or five pairs, subsessile, ovate, serrate, downy; flowers small, dense; umbels polygamous; fruit capsules oval, greenish-red, two-valved, one black seed.

X. Clava-Herculis, or southern prickly ash, is a tree twenty to forty feet high, the bark armed with thorns protruding through corky cones, larger thorns or prickles on the branches and petioles; leaves three to six pairs, crenate, unequal-sided, except the terminal one, which is equilateral, shining and smooth on the upper surface; flowers numerous, appear after the leaves, in cymes, and contain three pistils; taste warm, pungent, aromatic. Solvent, alcohol. Dose, five to fifteen grains.

CONSTITUENTS—Xanthoxylin, volatile oil, resin, bitter principle, tannin, sugar.

PREPARATIONS—*Extractum Xanthoxyli Fluidum*, Fluid Extract of *Xanthoxylum*. Dose, from half a dram to one dram. *Specific Xanthoxylum*. Dose, from five to sixty minims.

Physiological Action—This agent is a stimulant to the nerve centers, and through these centers it increases the tonicity and functional activity of the different organs. It is diffusible, producing a warm glow throughout the system and nervous tingling, as if a mild current of electricity was being administered.

It has a direct tonic effect upon the heart, and it mildly stimulates the capillary circulation throughout the entire body, overcoming blood stasis and congestion. In diseases of an exanthematous character it causes the rash to appear promptly and prevents its recession. It will sustain the vital forces through any crises that may occur.

Xanthoxylum in certain lines acts similarly to strychnine; in other lines it is superior to strychnine, having a wider action. In its effects on the capillary circulation it resembles belladonna or atropia, without the toxic properties. It must be well known to be thoroughly appreciated.

Specific Symptomatology—It is specific when there is lack of tone in the nervous system—a general torpidity with sluggish circulation; in enervation and relaxation of mucous membranes, with imperfect circulation, or hyper-secretion. It is thus valuable in catarrhal conditions of any mucous surface, as it restores the tone and normal functional activity.

In all conditions of the bowels where tympanites is present it is specific, quickly relieving this condition. King used it extensively in the cholera epidemic of 1849 with excellent results.

Therapy—It is a remedy for **catarrhal gastritis**. In general atonic conditions of the digestive apparatus, combined with *hydrastis canadensis*, it has no superior. It has a superior tonic influence upon the stomach and digestion, and improves the general nutritive functions of the system. Whitford gives it as a **tonic** in all conditions of **weakness**, depending upon malnutrition, accompanied with **chronic dyspepsia**, especially if catarrhal gastritis be present. The following is his method of combining the remedy:

R—Powdered *hydrastis*, two drams; precipitated carbonate of iron, one dram; tincture of *xanthoxylum*, one-half ounce; simple elixir, sufficient quantity to make four ounces. Take a teaspoonful after meals and at bedtime. The writer has used a similar combination, the active constituents in a capsule, every three hours, after eating, with most excellent results. This formula is especially applicable as a restorative after **debilitating fevers** and after prostrating diarrhoeas, or after dysentery. It works promptly and satisfactorily with children. The alkaloid *hydrastine* should be substituted for the powdered *hydrastis*, where prescribed in capsules.

This agent, with the older practitioners, was considered a most valuable remedy in **rheumatism**. Its stimulating diaphoretic action, with its restorative and tonic influence, placed it high in the estimation of many as a remedy in this condition. It is valuable in combination with such remedies as colchicum and cimicifuga.

As an alterative it had a wide use at one time. It was usually combined with stillingia, yellow dock or phytolacca, and often the iodide or acetate of potassium was added. It serves an excellent purpose in **scrofula**, and in some cases of chronic skin disorder, from disordered blood.

THE ALCOHOLS.

Alcohols, chemically considered, are a class of substances of organic origin, known as hydrocarbons, isomeric in character, belonging to a simple homologous series. They are the hydrates of the methyl group of organic radicals and are constructed as follows:

- CH_3HO . Methyl Alcohol. Synonym; Wood Alcohol.
- $\text{C}_2\text{H}_5\text{HO}$. Ethylic Alcohol. Synonym; Rectified Spirit of Wine.
- $\text{C}_3\text{H}_7\text{HO}$. Propylic Alcohol.
- $\text{C}_4\text{H}_9\text{HO}$. Butylic Alcohol.
- $\text{C}_5\text{H}_{11}\text{HO}$. Amylic Alcohol. Synonym; Fusel Oil.

Alcohol.

Alcohol proper, as commonly understood, is the second in the series—Ethylic Alcohol.

Under this head all substances containing Alcohol are treated in a general sense. Specific substances will receive specific mention. The common forms of Alcohol and of spirituous and malt liquors come under the following general or specific heads:

- Absolute Alcohol.
- Dilute Alcohol.
- Deodorized Alcohol.
- Whisky. Synonym; Spiritus Frumenti.
- Brandy. Synonym; Spiritus Vini Gallici.
- White Wine. Synonym; Vinum Album. Sherry Wine.
- Red Wine. Synonym; Vinum Rubrum. Port Wine.
- Rum.
- Gin.
- Porter.
- Cider.
- Kumyss.

Synonyms—Spiritus Vini Rectificatus, Rectified Spirit of Wine. Alcohol Ethylicum, Ethylic Alcohol. Ethyl Hydrate. Vinic Alcohol, Spirit of Wine.

Occurrence—Alcohol is the product of the fermentation of certain organic vegetable substances which contain sugar or starch—rye, barley, corn, rice, potatoes, the juices of certain fruits, molasses and milk. These are fermented in the manufacture of whisky, brandy, beer, ale, wines, rum, kumyss, etc. Alcohol existing in all vinous liquors after fermentation is separated from them by the process of distillation.

In each of these the fermentation is produced by the processes of nutrition of the *torula cerevisiæ*, a low microscopic form of vegetable life. In the processes of its growth and nutrition, it acts upon the sugar molecule, rearranging its atoms and appropriating a part to its own nutrition. Reducing the molecule $C_6H_{12}O_6$ to C_2H_5HO —alcohol.

Wine is the product of the fermentation of grape juice. Brandy is the distilled product of the same. Beer, ale and porter are the products of the fermentation of malted grains. Gin is the distilled product of the same fermentation. Rum is the product of the fermentation of molasses and the juice of the sugar cane. Cider is the fermented product of apple juice.

Description—Alcohol is a light, colorless, transparent, volatile liquid, with a sharp irritating taste and a spirituous odor. It is lighter than water, its specific gravity being only 0.80. It boils at 173 deg. Fah., and will freeze at -203 deg. Fah. It has a great affinity for water, mixing with it in all proportions.

Alcohol is an active solvent, dissolving solids of many kinds—alkaloids, resins, gums, oils, liquids, gases, etc. It destroys vegetable and animal tissues. It preserves animal tissue from decomposition by hardening, condensing and contracting its structure. It coagulates its albuminoids.

Alcohol Absolutum—Absolute alcohol is the pure alcohol, without water or other foreign substance. It is rarely obtained. That which is purchased for absolute alcohol contains at least two per cent of water. Alcohol U. S. P. contains ninety-four per cent of the absolute.

It has a specific gravity of 0.82. The rectified spirit of wine—spiritus rectificatus, Br. P., contains eighty-four per cent of the absolute alcohol.

Alcohol Dilutum—Dilute alcohol, U. S. P., contains fifty-four per cent of the absolute. This is about the same as the proof spirit of commerce. In its official form it is made by combining equal volumes of water and absolute alcohol.

It is an excellent solvent, dissolving many substances insoluble in water. Medicinal substances dissolved in alcohol are called tinctures. Gaseous and volatile substances so dissolved are called spirits.

Alcohol Deodoratum—Deodorized Alcohol contains about 92.5 per cent of Alcohol and 7.5 per cent of water. It is free

from Methyl or Amyl Alcohol, other foreign odors or organic impurities.

Physiological Action—Because of its immediate and profound influence upon animal tissues, Alcohol undiluted is not used internally. A small quantity taken in this form has produced immediate death. It is a powerful irritant and produces a shock from overstimulation to which the nervous system speedily succumbs. There are profound muscular relaxation, a sudden fall in the temperature, and diminished respiration. There is central vaso-motor paralysis which influences these functions, with direct depression of the action of the heart.

In small doses it acts as a prompt and general stimulant to every function of the body. There is an exalted sensation, a feeling of exhilaration, and a rise in the temperature and pulse rate that is not merely subjective, but actual and appreciable.

Its direct influence is upon the nervous system. It increases at first the normal functional operations of the brain, inducing a free flow of thought and expression, and a clearness and freedom of mental action without depth. This condition is rapidly increased until the harmony of action is lost and an extreme or exaggerated condition follows, which soon becomes a pronounced disorder of mental action, with incoherent and inco-ordinate irregular action of the mind and the body.

These effects are more pronounced in one not habituated to its use. Its continued use produces a toleration which often becomes extreme, but it induces a permanently debilitated and diseased condition of the nervous system, with a long train of symptoms known as alcoholism or dipsomania.

Acute Intoxication—In the first stage there is a want of mental balance, perversion of intellect, hallucinations, emotional excitement and inco-ordination.

In the second stage there are dilated pupils, stertorous breathing, more or less complete insensibility, a condition of coma, slow full pulse, complete muscular relaxation and great depression of the mental and physical faculties, with headache, nausea and vomiting. Recovery of the normal functions is in reverse order of their perversion.

Chronic Alcoholism—In this condition the power to resist fatigue or the results of injury, or to recuperate from prostrating diseases, is greatly lessened. There is established a gastrointestinal catarrh of a chronic character, with dilatation of the stomach often, which results in nausea, vomiting, anorexia and a confirmed dyspepsia. The integrity of the liver, kidneys and heart become greatly impaired, and fatty degeneration of these organs is common. The nervous system suffers greatly. There are serious lesions of the structure of the spinal cord, brain, and also of the neural structure in its distribution, resulting in faults of vision, neuralgias, paralysis agitans and milder forms

of muscular tremor and muscular inco-ordination. The heart and circulatory apparatus are seriously involved. There are palpitation, dilatation with valvular incompetency, and atheroma of the blood vessels. The arterial tension is so influenced that the functional action of all organs, especially that of the kidneys, is greatly impaired.

Its continued use fixes a habit or demand upon the individual which is imperative, and the satisfaction of which induces a mental and normal degradation exceeded by the use of no other agent with the one exception, perhaps, of cocaine alone.

There is anorexia in many cases, complete dyspepsia and mal-assimilation of food. Ultimately there is atony and permanent dilatation of the stomach. There is disordered liver which in time becomes organic, resulting in atrophy or hypertrophy, induration, fatty or amyloid degeneration, or at least extreme torpor with jaundice.

Cancerous conditions and other blood dyscrasias readily find a nidus in these depraved tissues. Permanent structural intractable kidney change occurs more often with this class of patients than in any other. There is diabetes mellitus, parenchymatous or interstitial nephritis or amyloid degeneration. It quickly produces alteration of function of the nervous system—a form of neurasthenia, structural change, and in some cases paralysis and locomotor ataxia and general inco-ordination.

The most lamentable condition, however, is the paralysis of the will, and the inevitable moral degradation and intellectual failure, which results often in imbecility.

Alcohol interferes with the elimination of carbonic acid and lessens the amount of nitrogenous tissue waste in the system. It is impossible to accept the theory of Wood, that because of the stimulating influence of this agent upon the digestion of the nitrogenous products, there is better assimilation and less nitrogenous waste. The nitrogen, if received, must at some time be eliminated if not as a food, then certainly as tissue waste. Alcohol, doubtless, interferes with the secretory function of the epithelium of the renal tubules and also materially alters blood pressure in the kidneys, and thus prevents the elimination of urea which remains in the blood. The specific gravity of the urine of most alcoholics is abnormally low, not alone because there is an increased quantity of the watery portion of the urine, but because the normal quantity of solids is not secreted.

Alcohol is appropriated to a certain extent within the system, the atoms within its molecule are rearranged or appropriated by different chemical substances in different combinations. This appropriation, however, is not great, especially in health, but in extreme prostration it is much greater, and there seems to be a gain in weight from its use. It is absorbed to a certain

extent by all absorbents, and is eliminated by the skin, kidneys and lungs. In confirmed alcoholics the ingestion exceeds the elimination to such an extent, that it is found in the fluids of the brain and of the cord, and its odor is perceptible in other fluids and tissues of the body.

When applied to the skin there is a sensation of coolness because of the rapidity of its evaporation and absorption of heat. If it be retained in contact with the skin and the air excluded it produces heat, irritation, redness and consequent inflammation.

Its hardening influence on the integument is induced by its ability to coagulate albuminoids, abstract water and dissolve fats.

Therapy—Alcohol is introduced into the system through the medium of wines, brandy, whisky, beers, etc., as the diluted Alcohol is not used to any extent as a beverage. In its therapeutic range the field is an important one, although many of the very best known physicians—Dr. N. S. Davis and others—believe that it is not needed as a medicinal agent, but can be substituted to even a better advantage by agents which do not induce the Alcohol habit. We believe that it is entirely unnecessary to prescribe as tonics or restoratives, wines, beer or any alcoholic beverages, or the alcoholic beverages under fashionable names, as malt tonics manufactured by brewers, or the fashionable tipple—beef, iron and wine.

As an emergency remedy, Alcohol, as an immediate stimulant, exercises an important function. In **heart failure** from **sudden shock**, in acute **prostration** of any character evidenced by weak heart, slow pulse and failing respiration, it is used. In **asphyxia**, either from the inhalation of noxious gases or from the use of anæsthetics or from drowning, hypodermics of brandy or whisky will enforce the heart's action, restore respiration and improve the general condition. It is of common use in shock after surgical operations, but is best used in conjunction with heart supporters and strychnine. It is given **preceding** the administration of **anæsthetics** to prevent shock. It promotes the action of the anæsthetic. In **poisoning** with depressing agents of a non-caustic or non-irritating character, and in the **bites** of **venomous snakes** and insects, it is of value.

Recourse is had to whisky in rattlesnake bites, and many cases, it is claimed, are saved by its use. It is always indicated in conditions of depression and general feebleness, without cerebral or circulatory excitement, and should be avoided in conditions of such excitement. In rapid and feeble heart from shock or from **acute anæmia**, as in post-partum hemorrhage, it slows the heart and sustains the vital forces until permanent restoratives have effected an improved condition. In these cases, frequently repeated small doses may be given in hot milk or even in hot water, and serve a much better purpose than large doses at longer intervals.

With the aged and feeble, in the convalescence of **prostrating diseases** of all characters, and especially after inflammation of the lungs, the agent is in common use as a restorative. It is a stimulant to the digestion and to the secretion of the digestive ferments. Its influence upon absorption and nutrition is not, we think, as desirable as that of other tonics non-alcoholic in character.

As a restorative to adynamic conditions it is given to best advantage in conjunction with concentrated nutritious foods, as in egg-nog, with eggs and milk, with albuminoids and with beef juices and meat extracts.

In some cases of prostration with distress and even pain, great restlessness and wakefulness, small, frequent doses, by building up the forces temporarily more nearly to the normal point, produce quiet restfulness and promote sleep. In **cerebral anæmia** its influence in temporarily re-enforcing the cerebral circulation will promote sleep, but the results of the sleep usually are not rest and are unsatisfactory.

Alcohol, externally, is an antiseptic. It is especially useful in suppurating **wounds**, and especially in preventing and curing **bed sores**. It is cleansing and stimulating, and promotes granulating and healing. In preparing for surgical operations it is used in full strength as an application to the skin to render it aseptic in the field of the operation.

In bruised and swollen parts, in inflamed joints and glands, it serves a good purpose. It hardens the skin and contracts the tissue, promoting healing by resolution and preventing abrasion, ulceration or suppuration.

It is prescribed in vomiting from atony, in the **vomiting of pregnancy**, in seasickness and in the vomiting of extreme prostration. It is even thought necessary to administer it to allay the uncontrollable **vomiting of delirium tremens**. It is advised in disorders of the stomach and bowels, in atonic, gastric and intestinal indigestion.

During the past four years much use has been made of hypodermic injections of Alcohol into the structure surrounding **cancer** and malignant growths, and into the immediate substance of the growth itself, with the result that in many cases the abnormal growth has at least been retarded, and in some cases removed. The method is considered one worthy of trial in a certain class of cases.

Amylic Alcohol.

Occurrence—This alcohol, the fusel oil of commerce, is the fifth in the series of the methyl group. It has a greater density than those above it in the series, and is of an oily consistency. In the process of the fermentation of grains, and especially

near the end of the process of the fermentation of the potato, this substance is generated. In the process of the distillation of whisky there finally appears a milky liquid, which allowed to stand, separates, and this substance, like an oil, covers the top. It is also obtained from this liquid by distillation.

Description—It is a transparent, colorless, mobile, oily, nauseous, offensive liquid, with a pungent odor and a caustic acrid taste. It boils at 269 deg. and congeals at —13 deg. Fah. It is soluble to a very light degree only, in water, but dissolves readily in alcohol and ether. It will dissolve fats, resins and camphor, also phosphorus, sulphur and iodine.

It was at one time the substance from which valerianic acid was made, as well as the valerianate of sodium and amyl nitrite

Physiological Action—In its physiological influence it acts much as large doses of ethylic alcohol act, producing muscular tremblings, which increase to an extreme convulsive type. There is general muscular relaxation, staggering, unconsciousness, cyanosis, reduction of temperature and pulse, and abolition of reflexes.

Wines and Malt Products.

Therapy—While wines are consumed in all civilized countries they are seriously detrimental to health. They induce plethora, gout, lithæmia and apoplexy, dropsy, unsteady nerves and enfeebled and disordered mental action. In the consideration of wines as medicinal agents, their action is fully covered under the subject of alcohol, as their medicinal effect in the main is due to the amount of alcohol they contain. It is true, however, that there is considerable difference in the action of different wines. They have more of a sedative influence upon the stomach, and probably possess greater nutritive properties. They are less stimulating than the liquors, but containing a larger quantity of sugar, their free ingestion induces greater disorders of the stomach, and is apt in some cases to produce constipation and fever.

In their application, however, to specific diseased conditions, they must be adapted with regard to the percentage of alcoholic strength, and with consideration to the percentage of nutritive properties.

Beer, ale and porter are malt products, and as stomachic tonics, as restorative agents, especially in pulmonary diseases, as stimulating nutritive agents for administration during recovery from protracted illness, they are considered as of much value.

CINCHONA.**CINCHONA CALISAYA.**

Synonym—Peruvian bark.

Part Employed—The bark.

Natural Order—Rubiaceæ.

Locality—South America.

There are some thirty-six species of *Cinchona* recognized. Three of these, producing yellow, pale and red bark, being the richest in alkaloids, are of the most importance.

Botanical Description—The *Cinchonas* are evergreen trees, forty to eighty feet high, one to two feet thick at the base; leaves opposite, laurel-like, entire, lanceolate or obovate, scarbicate on under side, midrib prominent; flowers tubular, fragrant, in terminal panicles, five spreading lobes of a purplish color; fruit capsule two-celled and split from the base upward to the persistent short calyx margin, containing many flat winged seeds.

Yellow Peruvian bark, the *Cinchona Calisaya* of commerce, is in single or double quills, one and a half to two and a half feet long, two and a half inches in diameter, and one-eighth to one-fourth of an inch thick; brownish-gray externally, cinnamon colored internally; covered with thin and closely adherent lichens; transversely and longitudinally fissured, giving it a checkered or warty appearance, which is called "chicken-legged." The more developed the fissures the better the quality, being evidence of maturity; fracture short, granular in outer layer, fibrous in inner layer; bast-cells single, powder yellowish-brown; odor slightly aromatic; taste bitter, astringent. Solvent, alcohol. Dose, ten to sixty grains.

CONSTITUENTS—Quinine, Quinidine, Cinchonine, Cinchonidine, Quinamine, tannic acid; thirty-two natural and eight artificial alkaloids, resinoid, volatile oil, gum, sugar and wax.

PREPARATIONS—*Extractum Cinchonæ*, Extract of *Cinchona*. Dose, one to five grains. *Extractum Cinchonæ Fluidum*, Fluid Extract of *Cinchona*. Dose, ten to sixty minims. *Specific Cinchona*. Dose, one to thirty minims.

Quinine Sulphate. Dose, one to twenty grains.

Quinine.

The pure alkaloids of cinchona are not employed in medicine, but their salts, formed from acid and basic combinations, are in common use.

In the consideration of the therapeutic properties of the various alkaloids of cinchona there is but little difference observed in their action. There is almost no influence exercised by any one of them that is not exercised to an equal extent by quinine,

and except where otherwise specified, the **Sulphate of Quinine** is the agent here considered.

Physiological Action—In doses of five grains three or four times a day for a few days, it produces fullness of the capillary circulation of the brain, throbbing in the head, suffusion of the face, ringing in the ears, with dullness of hearing, headache, mental confusion and nervous excitement. If the above doses be given every three hours continuously there is muscular feebleness, with general impairment of motility, increasing debility, great restlessness, with wakefulness, dilated pupils and partial loss of sight.

A single dose of sixty grains of quinine sulphate given to an adult male caused extreme depression, with feeble circulation, coldness of the surface and extremities, respiration slow and sighing; pulse slow and almost imperceptible, pupils widely dilated, sight and hearing almost extinct, voice very feeble; thirst great, tongue pale and moist, breath cold. While in some cases blindness from quinine has continued for some time in no case has it been permanent. Quinine has produced deafness also, which in many cases has been permanent. In some cases death has followed the administration of the remedy in disease, a result fairly attributed to the drug. In small doses it is tonic, in large doses stimulant, and in still larger doses sedative, acting on the cerebro-spinal nervous system and through the ganglionic nervous system on the heart. Besides the above named effects, large and repeated doses may cause gastric irritation, eructations, chill and fever paroxysms, headache, perspiration, vertigo, staggering and delirium—the condition known as cinchonism.

Specific Symptomatology—Quinine will act favorably upon the system if the skin be soft, if the mucous membranes of the mouth are moist, and if the tongue is moist and inclined to clear, if the pulse is full and soft and the temperature declining or at normal. In other words, when the secretory functions of the body are in a working condition, Quinine will produce no unpleasant results.

Quinine is specifically an antiperiodic. It will overcome malarial periodicity, especially if the above named conditions are present when the agent is administered.

It is profoundly tonic; under limited conditions it is antipyretic and also antiseptic. It has specific oxytocic powers over the parturient uterus.

Quinine destroys the *plasmodium malarie* readily, even in the minute quantity of one part to twenty thousand of water. Its influence upon malarial conditions can thus be readily understood.

Therapy—In the administration of Quinine as an antiperiodic, the beneficial influences are not altogether in propor-

tion to the size of the dose. Enormous doses may abort a chill if given during its course, or during the course of the fever. They are very likely, however, to increase the nervous erethism and the temperature; whereas, if proper doses be given *during the intermission*, from one to three hours preceding the anticipated attack, or at the time when the temperature has reached *its lowest point*, small doses will accomplish positive results.

In **continued fever**, with a sufficiently marked remission occurring at a given time each day, or on each alternate day, the agent should be given during the remission, provided the temperature declines to a point sufficiently low to admit of a temporary restoration of the suspended secretions. This point is usually not above $101\frac{1}{2}$ degrees. If the remission be short, a single dose may be given. As a result the temperature does not run quite as high as on the previous day, and the next remission is more marked and of longer duration. At this time, perhaps, two full doses, two hours apart, may be given. The fever is still lower and the remission so marked by the third day that the agent, in reasonable doses, may be continued through the exacerbation, the temperature at no time, probably, rising above 101 degrees and not increasing above normal after the third day.

The writer has adopted this course for so many years, with perfectly satisfactory results, that the method is confirmed in his mind as the proper one in all cases where malaria is the cause.

Where continued fever exists, Quinine is of no benefit if there is no marked remission or other evidence of malaria. It is thus of no use during the progress of typhus, typhoid and other protracted fevers. In such cases it causes nerve irritation and increased temperature, especially if there is deficient secretion.

When the fever is broken and there is a tendency toward a restoration of secretion, and the temperature is normal or sub-normal, then this agent is a vitally important one. Here the bisulphate, being readily absorbed, produces the happiest results.

In **intermittent fevers** it is excellent practice to give the remedy in broken doses during the intermission. The absorption of the sulphate of Quinine takes place so slowly that a period of between four and six hours is required, under favorable circumstances, to develop the full effect of the remedy. A dose of from three to five grains, given five hours before the expected paroxysm, will exercise its full influence upon the paroxysm when it should appear.

If another dose of two and one-half grains be given two hours after the first dose, and a third dose of the same size be

administered after another period of two hours, or one hour before the chill will occur, the effect of the agent will be uniformly continued during the time in which both the chill and the fever would have reached their highest point. The repetition of this course on the second and third days will usually be sufficient to overcome the most severe cases. It is well to adopt the same course on the seventh, fourteenth and twenty-first days following the attack.

The following formula is of excellent service in those cases in which the liver and other glandular organs have been profoundly influenced by the disease, and where the nervous system shows considerable depression:

R—Quiniæ Sulphat.	-	-	-	-	grs. xl.
Leptandrin,	-	-	-	-	grs. iv.
Capsici pulv.	-	-	-	-	grs. vi.
M. Ft. Capsulæ,	-	-	-	-	no. xii.

Sig. One capsule in the manner above specified every two hours until three are taken. When the paroxysms no longer appear, two or three grains of Quinine may be given regularly every three hours during the day.

In the treatment of **congestive chill**, and in malignant conditions of malarial origin, Quinine is specific, but should be given in much larger doses, and usually with some direct stimulant and in conjunction with the use of external heat. It may be given in doses of twenty grains preceding the attack, or with stimulants during the attack. If a severe attack is fully anticipated, large doses should be repeated every two or three hours during the entire remission.

As an **antipyretic** Quinine is no longer used. It was once considered of essential importance in the reduction of high temperatures, but the conditions and character of its action were so imperfectly understood that it often did harm, and caused an increase in the temperature instead of a reduction. In the regular school the coal tar antipyretics have replaced it. With our own school it has been at no time depended upon to allay fever.

As a restorative after **pneumonia**, where hepatization has been extensive, this agent is an important one. Two grains of the bisulphate of Quinine, with one-fourth of a grain of ipecac, and perhaps the one-fourth of a grain of nux vomica, will rapidly improve the function of the nervous system and of the circulation, and as rapidly overcome the hepatization and other results of inflammatory action. The influence upon the stomach and intestinal canal, and thus upon the digestion and assimilation of food, is marked and immediate.

Quinine is a stimulant tonic of great value. Its influence is exercised to the best possible advantage when there is impaired or deficient nerve force.

It is indicated as a restorative after prostrating disease, especially after continued and inflammatory fevers. It strengthens the action of the heart, improving the character of the circulation of every organ. It arouses the digestive organs and encourages assimilation and nutrition. It stimulates the liver and kidneys, and thus assists in the rapid elimination of the waste products of the disease. It stimulates the respiratory function, promoting oxygenation of the blood, thus assisting in the restoration of the character of that fluid.

These results are accomplished largely through its profoundly stimulating influence upon the cerebral and spinal centers.

It has been the writer's custom to use the bisulphate of Quinine as a tonic instead of the sulphate, because of its free solution and rapid absorption. It is milder in its effects upon the nerve centers and fully as efficacious in its tonic influence. It is combined to excellent advantage with hydrastine, nuxvomica or the salts of iron.

Or it may be given with strychnine or picrotoxin or ignatia with excellent results, and if the liver is complicated, it may be combined with leptandrin, podophyllin or iris.

In chronic **congestion of the liver**, or **splenitis**, Quinine dissolved in the tincture of the chloride of iron, and combined with syrup of orange or simple elixir, produces satisfactory results.

In the prostrating **night sweats** following malarial fever this agent, in the above combination, is a fine tonic, quickly overcoming the sweating and other results of the disease.

Where **paludal miasm** is the cause of various indefinite disorders, or of general malaise, the phenomena occurring periodically, Quinine should be given to anticipate the unpleasant symptoms. **Dumb ague**, **hemicrania** and severe general headaches, **neuralgias** of various kinds and **asthmatic attacks** occur from this cause and are satisfactorily treated with this remedy. It may be afterward given as a tonic, in combination with any other tonic agent which may be specifically indicated.

Quinine has a direct power in inducing **contraction** of the parturient **womb**, especially if from inefficient strength the labor has been prolonged until the nervous force of the patient is well nigh exhausted. If fifteen grains be given in one dose, it may overcome all undesirable conditions at once and prove sufficient. The contractions are normal in frequency and of regular character and force.

It thus overcomes all inertia and will prevent post-partum hemorrhage. It is a good remedy for this latter condition when it has occurred, acting also as a stimulant to the heart and nervous system. It is a dangerous remedy in large doses during pregnancy, as it may bring on premature labor.

In **amenorrhœa** from cold it is useful and may be prescribed

alternately with aconite, after a hot bath has started secretion from the skin.

As a stimulating antiseptic it has been used as a wash in very many conditions. In sluggish ulcers and old sores, where there is no activity to the capillary circulation, it may be applied with good results. It is useful in threatened gangrene and in chilblain. It was at one time extensively used as a throat wash in diphtheria, and to its antiseptic character is credited its beneficial influence upon whooping cough, having been much depended upon for the cure of that disease.

A douche made by dissolving six or eight grains in a pint of hot water will be found of service in chronic catarrh, with fetid discharge, and in hay fever. In the latter condition, full doses internally, three times a day, will materially improve its local influence.

In the administration of Quinine to children in all but the severest of malarial conditions, it may be administered by inunction, and all of the results of internal administration obtained. The soft skin of the chest, axillæ, abdomen or groins is bathed with hot water and quickly dried, and the ointment immediately applied. From three to five grains of the sulphate is thoroughly rubbed into two drams of lard, and the whole applied during the early part of a remission or intermission. The course must be repeated on consecutive days for four or five days. If the fever is then broken or the chill does not occur, the application can be made regularly once in eight or twelve hours, but of less Quinine, and continued as a tonic as long as a tonic is needed. No one will administer Quinine per ore to children who has used this method successfully.

EUCALYPTUS.

EUCALYPTUS GLOBULUS.

Synonym—Blue-gum tree of Tasmania.

Part Employed—The leaves collected from the older parts of the tree.

Natural Order—Myrtaceæ.

Locality—Australia.

Botanical Origin—The Eucalyptus is one of the largest known trees, 300 to 350 feet high, 10 to 20 feet thick; bark smooth, ash colored; leaves petiolate, alternate, oval-lanceolate, scythe-shaped, a foot long, entire, coriaceous, gray-green, containing numerous oil glands, feather-veined between the mid-rib and marginal veins; flowers pinkish-white, axillary, single or in clusters; leaves have a strong balsamic odor and an aromatic, pungent, bitter taste. Solvents, alcohol, water. Dose, ten to sixty grains.

CONSTITUENTS—A volatile oil, Chlorophyll, Eucalyptol resin, tannin, etc.

PREPARATIONS—*Extractum Eucalypti Fluidum*, Fluid Extract of Eucalyptus. Dose, ten to sixty minims. *Specific Eucalyptus*. Dose, five to thirty minims. *Oleum Eucalypti*, Oil of Eucalyptus. Dose, two to twenty minims.

Eucalyptol.

This substance is the product of the distillation of the oil of Eucalyptus at a high temperature (347 degrees Fah.). It is identical with a substance found in cajuput, mentha, rosemary, curcuma, santonica and some others. It is a colorless liquid, crystallizes, when reduced to a low temperature, in long, needle-shaped crystals. It has an aromatic, camphoraceous odor and a cooling, pungent taste. It is soluble in alcohol and in glacial acetic acid, and should be kept in dark-colored glass bottles with ground-glass stoppers in a cool place. The dose is six to ten minims, in a capsule or in emulsion, four times daily.

Physiological Action—In toxic doses the agent produces drowsiness with loss of muscular power, cold skin, pale lips and cheeks, feeble pulse, short and irregular breathing and contracted pupils. It produces increased action of the kidneys, pain in the stomach and bowels, indigestion and diarrhœa. It is eliminated through all the emunctories. The inhalation of the vapor of too large a quantity of the oil has produced the nervous phenomena above described in children, but this result is rare.

After a moderate dose of the oil of Eucalyptus, in which its chief virtues reside, there is a feeling of exhilaration and buoyancy, while after very large doses there is depression, with drowsiness, loss of power in the limbs, skin pale, cold, insensible; pupils contracted, pulse imperceptible, breathing short, jerking and interrupted.

The poisonous effects should be treated with the usual diffusible stimulants—strychnia, alcohol and atropine.

Therapy—In therapeutic action this agent closely resembles cinchona. It is antimalarial, antiperiodic, febrifuge and tonic. The tree has been planted in malarial sections, and wherever planted the malarial condition has been changed, the disease germs destroyed and the atmosphere purified, the locality becoming healthful and sanitary.

While acting similarly to quinine it may be prescribed where quinine is contraindicated. Its stimulating and antiperiodic influence is not so immediately marked, but its antimalarial influence is persistent, and satisfactory results are ultimately obtained.

It may be given in **low forms** of **fever** where the stimulating influence of quinine is too great, increasing the fever. In these cases Eucalyptus will reduce the fever.

In the condition known as **dumb ague** and masked intermittent fever, it will sometimes accomplish very satisfactory results. In all conditions where there may be malarial infection, especially where other disease is present which shows a marked increase at a given time each day, where there is much malaise and muscular aching or distress of a distinctly periodical character, this agent is directly indicated in doses of one-half dram of the tincture.

It is of much service in malarial neuralgia, in malarial headaches and in vague intermittent conditions of an undefinable character.

Where night sweats follow malarial disorder, where an enlarged liver and spleen remain after the periodicity is broken, where jaundice has been a more or less persistent complication, this agent has been of much value, combined with other indicated measures.

The antimalarial and distinctly antiseptic properties of Eucalyptus give it a prominent place in the therapeutics of **typhoid fever**; while it has many of the essential tonic and restorative properties, it is most active as an intestinal antiseptic. It has been used in epidemics of typhoid where there could be no possibility of a mistaken diagnosis, and given from the first all the symptoms showed positive amelioration. The temperature especially was kept under control, while the disease symptoms were markedly controlled. It has been especially noted by those who have used this agent persistently, that the attendants are not likely to contract the disease. This is attributed to the fact that the agent destroys the germ within the intestinal canal.

Eucalyptus is a valuable remedy in **scarlet fever**, given in conjunction or alternation with aconite and belladonna. It answers an excellent purpose in many cases. It prevents the symptoms developing in a severe form by destroying the germs and assisting in the control of the temperature. It cures the throat symptoms quickly. It stimulates a normal action in the glands of the skin, and by encouraging elimination through these glands, prevents **post-scarlatinal nephritis**. Five drops in lard thoroughly rubbed together and applied to the skin daily, is one of the most efficient of applications. When nephritis is present it has a positively curative influence.

In the treatment of **diphtheria**, Eucalyptus is an excellent remedy. It may be used as a gargle diluted, and when the membrane has formed in the larynx or in the nasal passages, if fifteen drops of a mixture of equal parts of the oil of Eucalyptus and turpentine be dropped onto the surface of hot water in

a close-mouthed vessel, and the vapor inhaled by the patient for a few minutes every two hours, there is nothing that will more speedily destroy the membrane and assist in its removal.

The writer has been successful in completely clearing the nasal passages within thirty-six hours by this measure when the occlusion was nearly complete. This course is almost equally applicable in membranous croup. A specific measure in this disease is to give internally every two hours five drops of a mixture of equal parts of the tinctures of Eucalyptus and jaborandi. If the membrane has formed extensively, this course loosens it and permits it to be thrown off. If it is in the early forming stage, the growth ceases and the membrane disappears. These facts have all been confirmed by a multitude of cases.

Eucalyptus is further used in tonsilitis, in chronic **post-nasal** and bronchial **catarrhs**, in **asthma**, in which case the vapor either alone or with that of stramonium is very useful, and in those conditions of the lungs and bronchi where there is offensive expectoration, pus or a suggestion of gangrene. In the constitutional treatment of **phthisis** it is of value, and if a few drops of the oil be added to cod liver oil, it will remove the disagreeable flavor of the latter agent.

This agent has been used with excellent results in the treatment of **chronic ulceration** of the stomach. It stimulates the mucous surface to normal action, destroys the germs of the disease, prevents putrefaction and corrects excessive acidity. The ulcers heal rapidly under the influence of this remedy. It is equally efficacious in chronic diarrhoea and dysentery with offensive discharges.

The agent has been extensively used in the treatment of **catarrh** of the **bladder**, **nephritis**, **pyelo-nephritis** and **pyelitis**, especially if the urine is decomposed and offensive. It is useful also in **gonorrhoea** and in **gleet** and as a wash in specific vaginitis.

In uterine catarrh this agent is valuable used as a douche in the proportion of two drams of the tincture to a pint of water. Whenever offensive discharges from these parts are present, it is useful in ulceration of the cervix. It may be made into a suppository with cocoa butter and white wax, in the proportion of one part of the oil to three parts of the other mixed constituents. This suppository is of great service after labor, either where the douche cannot be used or to be inserted after the douche where there is traumatism. This suppository is of value in uterine cancer. It relieves pain and corrects the odor of the discharges.

AMMONIUM PICRATE.

Synonym—Ammonium Carbazotate.

Description—An intensely bitter salt, forming in needle-shaped crystals of a dark yellow or orange tint. It is freely soluble in water, and in alcohol.

Physiological Action—Its intense permanent yellow color is imparted to all tissues with which its solutions are brought in contact, and when taken for a length of time into the system it imparts its color to the blood serum and thence to the conjunctiva and to the skin. It has an intensely bitter taste. It is an irritant to the stomach and bowels.

Administration—It is prescribed in doses of the one-eighth to the one-half of a grain, and because of its taste it is given in pill, tablet or in capsule form; better in capsules.

It is toxic in overdoses, and must be administered with care, especially if its continued use is desired.

Therapy—This agent is markedly antiperiodic. It is a tonic of much value and to an extent astringent.

It is given in persistent **intermittents**, and in chronic ague where quinine has not succeeded.

It is especially restorative in the debilitation following this condition, if there are persistent exhausting discharges. It controls **diarrhœas** of a chronic or bilious character and improves the general tone of the system at the same time.

It exercises a sedative influence upon spasmodic coughs. One of our physicians has had an extended experience in the treatment of **whooping cough** with picrate of Ammonium. He dissolves three grains in four ounces of water, and gives from twenty to forty drops at a dose, to a child from three to five years old, every two hours. It would be better to dissolve a correspondingly smaller quantity and give a teaspoonful at a dose. The doctor says it quickly cures those cases where there is a "persistent, dry, hacking cough, attended with dryness of the tongue and throat, or a rapid, spasmodic cough with a decided tendency to result in a well-marked whoop, in severe cases the cough continuing until emesis ensues."

Ferric Picrate—The Picrate of Iron will serve for many of the purposes of the Ammonium salt, to which it is superior in tonic and restorative properties.

CHAPTER II.

ANALEPTICS—CORROBORANTS.

HYDRASTIS.	KOLA.
GOLD CHLORIDE.	COFFEE.
GOLD AND SODIUM CHLORIDE.	CAMPHOR.
PHOSPHORUS.	CAMPHOR MONOBROMATE.
PHOSPHORIC ACID.	MYRRH.
AVENA.	MUSK.
COCA.	

HYDRASTIS.

HYDRASTIS CANADENSIS.

Synonyms—Golden seal, Yellow puccoon.

Part Employed—The rhizome and the roots.

Natural Order—Ranunculaceæ.

Location—United States, growing in moist, woody sections, in the northern and central parts.

PREPARATIONS—Specific Hydrastis, alcoholic, contains a bitter coloring principle, berberine, and the white alkaloids, Hydrastine and canadine, and resinous and oily principles. Dose, from one to ten minims. Colorless hydrastis, non-alcoholic, contains the colorless alkaloids and the inorganic salts dissolved in glycerine and water.

Extractum Hydrastis Fluidum, Fluid Extract of Hydrastis. Dose, three to twenty minims.

Extractum Hydrastis, Inspissated Extract, Extract of Hydrastis. Dose, one to five grains.

Tincture of Hydrastis. Dose, from twenty minims to two drams.

Hydrastis Pulvis, Powdered Hydrastis. Dose, from three to fifteen grains.

Hydrastine. Dose, from one-half to three grains.

Hydrastine Hydrochlorate. Dose, from one-tenth of a grain to three grains.

Botanical Description—(J. U. Lloyd)—Hydrastis grows in patches in rich, open, hilly woods. The stem is produced from a terminal bud of the perennial rhizome. Its growth is very rapid; a week's or ten days' continuance of warm weather in May is sufficient for it to grow six inches high and to expand its flowers.

The fertile stem is from six inches to a foot high at flowering time, round, erect and about an eighth of an inch in diameter. It is naked below, and at the top apparently forks, one branch bearing a leaf, the other a smaller leaf and flower.

The leaves at the flowering time are only partly developed; the lower is larger, measuring from two to three inches in diameter; the upper, which is about half as large, encloses the flower in the bud, and is generally but partially unfolded when the flower opens. After the plant has flowered, the leaves

grow to be six to eight inches in diameter. In shape they are roundish cordate, and have five to seven palmate lobes. The veins are very prominent on the lower side of the leaf.

The three petal-like flowers are small, white and last but a few days. The sepals are only seen in the bud, falling away when the flower expands. The numerous stamens have white filaments, and they are the most conspicuous part of the flower.

The fruit ripens in July, turning from green to bright red. It is borne on an erect stalk about an inch long. In shape it resembles a large red raspberry, with coarse drupes.

CONSTITUENTS—Berberine, Hydrastine, Canadine.

Physiological Action—In its influence upon the nervous system, this agent has stimulating properties in part analogous to those of strychnia. Its influence is more slowly developed and more permanent. In extreme doses it blunts the sensibility of the terminal nerve filaments, and convulsions have resulted from its use.

It stimulates the respiration and circulation, imparting tone and increased power to the heart's action, increasing arterial tension and capillary blood pressure. It influences blood stasis similarly to ergot and belladonna.

The tone imparted to the muscular structure of the heart differs from that imparted by strychnia in being permanent and not spasmodic or intermittent in character. It influences muscular structure everywhere in the system in the same manner. It stimulates normal fibrillar contractility and increased tonus, encouraging the nutrition of muscular structure. It inhibits the development of superfluous muscular tissue and abnormal growth within that structure. It is thus most valuable in altered conditions of the heart muscle.

In its influence upon the gastro-intestinal tract it is tonic, restorative and soothing in its action. It promotes the appetite, increases the secretion of the gastric and intestinal juices and conduces to a restoration of the normal condition. It increases peristaltic action and general muscular tonus in the structure of walls of the stomach and intestines.

The alkaloids have been given in sufficient quantity to produce death in the lower animals in experimental investigation, but it cannot be considered toxic in medicinal doses. It produces convulsive action, followed by decreased irritability of the vagus, the blood pressure is suddenly decreased and the heart fails in diastole.

Its elimination is comparatively active and is largely accomplished through the kidneys.

Therapy—In its therapeutic influence its widest range of action is upon the **stomach**, in **functional disorders** of that organ. It is the most natural of stimulants to the normal function of digestion. Its influence upon the mucous surfaces renders it

most important in **catarrhal gastritis** and gastric ulceration. It supersedes all known remedies as a local, and also as a constitutional tonic when this condition is present.

In administering this remedy, if there is irritation, the fluid and less bulky preparations are preferable. If there is marked **atonicity** with inactivity of the **stomach** and lack of nerve sensibility, the powdered drug in five grain doses is the most useful. This increases the tone, reduces abnormal secretion, stimulates normal secretion, promotes the appetite and increases the quantity of the digestive juices, and thus favors the digestion. It is most excellent in indigestion in such cases, acting in a more rational manner than the digestives which have no influence beyond that immediately exercised upon the food within the stomach.

In extremely irritable conditions a solution which contains one or two drops of the specific Hydrastis, or the colorless Hydrastis, or in extreme cases the one-twelfth to the one-fourth of a grain of the Hydrochlorate of Hydrastine is preferable to large doses of Hydrastine or the powdered Hydrastis. In some cases powders, or the precipitated principle, will irritate the stomach, producing weight, distress or even mild pain if the stomach is empty. In such cases it is best given after a little food has been taken, or in conjunction with the subnitrate, the oxide of bismuth, or with a digestive if the stomach contains food.

In those cases of **atonic dyspepsia**, where the entire apparatus, including the liver, is stagnant and inoperative, one-fourth of a teaspoonful of the fluid Hydrastis or of the colorless Hydrastis dissolved in water will restore a normal condition of the glands and of the entire mucous membranes.

The agent relieves the **chronic constipation** of plethora or muscular inactivity in relaxed, inactive, feeble cases. Its influence is encouraged by combination with nux vomica. It overcomes **hepatic congestion** in such cases and catarrh of the gall ducts. It may be combined with podophyllum, leptandra or iris.

It is a most superior remedy in the atonic conditions of these organs in **chronic alcoholism**, and if combined with large doses of capsicum and with forced nutrition, will in great part supply the demand for alcoholics and assist in the cure of the disease. It acts as strychnia does in the cure, and may be most beneficially given in combination with that agent.

The tonic and nerve strengthening properties of this agent have long been utilized by the writer in all cases of **gen-ral debility** and nerve prostration, especially if associated with the conditions of the digestive and assimilative organs named. It is an admirable restorative tonic. It is demanded in convalescence from **protracted fevers** and debilitating inflammation,

and as a general restorative after overwork, in the condition known as a complete "breaking down."

The usual manner of prescribing it is to give a grain of Hydrastine, two grains of the bisulphate of quinine, one grain of the carbonate of iron and one-fourth of a grain of capsicum in a capsule every three hours, after eating something simple, that the stomach may not be entirely empty. The improvement is remarked by the patient usually from the first. It is a simple tonic, but has no superior. In some plainly indicated cases, the quinine salt may be replaced with one-fourth of a grain of *nux vomica*.

The influence of the agent is certainly direct upon the central nervous system, promoting a normal circulation and increasing its nutrition.

It will yet be found applicable in the treatment of **cerebral engorgements** of a chronic character, and in the treatment of **hyperæmia** of those organs, in the cases in which ergot is used.

It is valuable in from one-fourth to one-half teaspoonful doses of the fluid Hydrastis, or colorless Hydrastis, in water, in **prostrating night sweats**.

In its power over the nutrition of muscular structure, it is a most important remedy in many **disorders** of the **womb**. It produces contraction of the unstriped muscular fibers, slowly but permanently stimulates the removal of excess of growth. In parturition it is not so immediate or forceful as ergot, but acts mildly in the same manner. In **uterine subinvolution**, in **menorrhagia** or **metrorrhagia** from this cause, it is the best remedy we have.

It is useful also in **post-partum hemorrhage**, but is rather slow in its action when immediate results are demanded. In the incipient stage of the development of tumors within the uterine structure, or fibroid growths, it is not excelled by ergotine. It may be used hypodermically in these cases, and its results are comparatively permanent.

In the treatment of **cancer** or **scirrhus** of the **breast** Dr. Hale has had excellent results from the use of this remedy. He uses the mother tincture in conjunction with conium, giving five drops at a dose three or four times a day, the Hydrastis before, the conium after meals. He says: "Sometimes I mix them and give ten drops of the mixture three times a day."

Hydrastis is directly indicated where the **tumors** are hard and painful; conium where they are small, hard and painless. Where the swelling is soft or undulated and painful on pressure, and pain extending into the axilla, we find *phytolacca* in the same doses better than either. Sometimes all three remedies are good together, and none of them is valuable in the open cancer. The remedies must be continued a long time to make a decided impression, and their effect is even increased by the

same remedies being applied externally in the form of a plaster.

In all **catarrhal conditions**, especially if there be muscular relaxation and general enfeeblement, it is a useful remedy. It may be given internally and used locally. It is used locally in solution and is of much value as an application, wash, irrigating fluid or gargle in all such **catarrhal, ulcerating, apthous, indolent** and otherwise unhealthy conditions of **mucous surfaces**. Its application to **nasal catarrh** has been mentioned. It is a most useful gargle in apthous or **ulcerated sore mouth**, in conditions where the gums are spongy or loosened from the teeth or bleed easily. In **diphtheria** and in **tonsilitis** as a gargle it is extremely useful.

Ten minims of a fluid preparation, to the ounce, may be used, or a solution of the hydrochlorate of Hydrastine in **nasal catarrh**, in **inflammation of the eyes** and in **gonorrhœa**. One grain of the hydrochlorate in an ounce of rose water, with or without five grains of the sulphate of zinc, is of superior value in purulent conjunctivitis. The same preparation, diluted, is useful in gonorrhœa. Five drops of the solution in a dram of warm water is the proper strength. The colorless Hydrastis in a solution with a small quantity of the potassium chlorate is sometimes superior in nasal catarrh. It is most serviceable in this condition if dilute.

It is the best of washes in **leucorrhœa**, whatever the cause, and it can be used freely without danger and in various strengths—from one dram to three, to the pint of hot water. It is of much service when the discharge is thick, yellow, and the membranes relaxed and feeble. In simple cases half a dram to the pint is beneficial.

It forms an excellent wash in **eczema** of the **anus**, with ulcers or fissures within the rectum. Its use may be followed with the application of a zinc ointment, with twenty-five per cent its weight of bismuth subnitrate. In mild solutions or the hydrochlorate of the alkaloid one-fourth grain to the ounce, it is serviceable in **catarrh** of the **bladder**, as an irrigating fluid.

GOLD CHLORIDE.

Formula— AuCl_3 .

Synonym—Chloride of gold.

Occurrence—The chloride of gold is formed by the action of nitro-hydrochloric acid upon gold, which unites in the course of the decomposition with nascent chlorine.

Description—It is a reddish crystalline body, very deliquescent in moist air.

GOLD AND SODIUM CHLORIDE.

Formula— $\text{AuCl}_3 + \text{NaCl}$.

Synonym—Chloride of gold and sodium.

Preparation—Made by adding to a solution of the gold chloride, a solution of an equal amount of the pure sodium chloride. The mixed solutions are thoroughly stirred and evaporated and the double or mixed salt is thus precipitated. The crystals are of a golden yellow color and are permanent in the air. It is soluble in water and partially so in alcohol.

Dose, from one-twentieth to one-fourth of a grain.

Physiological Action—These agents increase the functional activity of the nervous system. The mind becomes clearer and the brain assumes an apparently exalted condition. Thoughts flow more freely and their expression is more fluent. Cheerfulness is induced and there is a general sense of well-being.

At first the influence is like that of any stimulant, but afterward a permanency of the improved condition is observed. It exercises a direct effect upon the sexual apparatus, increasing sexual desire and the sexual powers. In the male there may be painful erections, in the female an increase of the menstrual flow.

The chloride is the most poisonous of all the compounds of gold. It is considered more toxic even than the corrosive chloride of mercury, and poisoning from its use should be treated in the same manner. It produces ulceration and inflammation of the stomach and bowels, with intense pain, with general irritation of the organs.

Specific Symptomatology—The direct indications for its use in gastric troubles are a red, sleek or glazed tongue, anorexia, pain increased on the ingestion of food, extreme epigastric tenderness with bowel movements apparently induced by the taking of food.

It is indicated also in **general exhaustion** of the nervous system, especially if complicated with an impairment of the blood, or with constitutional dyscrasia, as it is an active alterative, acting much as mercury and its salts are claimed to act.

Therapy—The chloride of gold and sodium is of value in the **hypochondria** and nervous weakness of **tertiary syphilis**. It is of value in all forms of **neurasthenia**, in **sterility**, in the premonitory stages of **Bright's disease**, but should be used cautiously, if at all, in the latter stages. It is useful in **consumption**, in **chronic diarrhœa** to sustain the nervous forces, and in **chronic dyspepsia**, and other hindrances to appropriation and assimilation.

In general impairment of the digestion and nutrition it is an excellent stimulant to the stomach and nutritive functions of

the intestinal canal. It is a stomachic tonic of much value. In these cases it should be given in doses of not more than the sixteenth of a grain and even down to the one one-hundred and twentieth or two-hundredth, and repeated every two or three hours. Its influence upon the liver at these times is believed to be most satisfactory, especially if catarrh of the bile duct or duodenum is present.

It seems to exercise a selective action for the genito-urinary organs. It has been commended in chronic irritation and even in chronic inflammation of the uterus and of the ovaries, where this condition has made a profound impression upon the nervous system, and induced nervous exhaustion with a general atonic condition of the system. It has been long used in syphilis and other blood dyscrasias where the results named were marked, and where there was impaired nutrition, also where there were enlarged lymphatic glands and scrofulous swellings or ulcerations. In diabetes mellitus the agent has been spoken well of, and in some cases it is an important addition to the treatment. The chloride and the double chloride are both used in the treatment of **dipsomania**, seldom alone, but usually in conjunction with the sulphate, or the nitrate of strychnia and atropine, and for its moral effect, in some cases with apomorphine.

The results of the combined treatment have been, no doubt, satisfactory, as the statistics of "retreats and reform institutions" show nearly ninety-nine per cent of cures. It would be gratifying indeed if but a fraction of this number could be cured of the deadly habit, and most satisfactory to know that the administration of these agents hypodermically, and other agents, such as capsicum, per orem, and strong concentrated nutrition, will cure many cases. A discouraging relapse, from the continued influence of vicious associates, or the entire physical or mental collapse of an occasional patient whose constitution was completely undermined by previous indulgence, should not deter the physician and friends from making a most determined and persistent effort to restore every patient desiring restoration. It is useless to undertake to cure one who does not desire to be cured, as future indulgence will render his physical and mental condition more debased than before.

Some of those who have used mercury in the treatment of **syphilis**, believe that all the alterative effects of that agent are found in this, and in addition the profound nerve tonic and restorative influence of this agent renders it much superior.

PHOSPHORUS.

Symbol—P.

Occurrence—Phosphorus was discovered by Brandt in the product of evaporated urine, in 1669. It does not occur free, but is always found in combination, most often with calcium, sodium and potassium. It is derived from the ashes of bones, in which it exists as the tricalcium phosphate.

Description—An elemental substance, translucent, wax-like, yellow, solid, luminous in the dark, unstable in the air; insoluble in water, but soluble in alcohol, petroleum, ether and the bisulphide of carbon. It melts at 112 degrees, boils at 554 degrees, giving off a colorless vapor.

It may exist in two distinct allotropic states. The first is the form just described, and the second is the variety known as the red Phosphorus. The red variety is insoluble in those solvents which will dissolve the other form. It has no odor, does not oxidize in the air and is neither luminous nor poisonous. It is prepared by retaining the ordinary variety at a heat of 500 degrees for thirty-six hours. The heat destroys its affinity for oxygen.

Administration—It should be given in doses of from the one-one hundred and sixtieth to one-eightieth of a grain and repeated according to the indications. Larger doses may be given if its physiological effects are desired.

A tincture is prepared by macerating Phosphorus for thirty days in alcohol, with occasional agitation, in the proportion of fifteen grains to the ounce. It is not officinal. One drop of this, carefully increased, may be given as a dose.

Physiological Action—It is violently poisonous, producing its effects by deoxidation of the blood. In overdoses it produces violent inflammation of the stomach and intestines, intense burning pain, prostration, cold skin, clammy perspiration, vomiting and death. There is great anxiety, restlessness, intense headache, vertigo, wild erotic delirium and coma. The vomiting is of a coffee-ground liquid, resembling the black vomit of yellow fever. The urine is scanty and albuminous, and may be finally suppressed.

Its protracted use will in some cases induce a phosphorus habit, very difficult to overcome.

The agent is the most powerful nutritive stimulant to the nervous system, and a valuable nerve tonic—a trophic in the strictest sense, as it supplies a needed constituent. For this effect it is given most often in its combinations, but there are specific effects that can only be obtained when the agent is given in its uncombined form. After a dose of the one-twentieth of a grain there is a peculiar exhilaration experienced, a renewed capacity for mental and physical exertion. There is increased strength and renewed vigor.

The acids of Phosphorus, and the phosphates and hypophosphites, are common restoratives to the osseous and nervous structures of the system.

Specific Symptomatology—Its direct indications are **exhaustion** of the **nerve forces**, more or less complete, of a general character, as that following protracted fevers and malignant disease. In nervous exhaustion, of whatever character, especially that following mental strain and over-work. The **insomnia** of nervous prostration is quickly relieved by it.

Therapy—In loss of nerve force of a local character it is reliable, such as **functional impotency**, **neuralgia** from cerebral anæmia and **weak heart action** from nervous exhaustion. It is valuable in **mental failure**, in **paralysis agitans** and in certain diseases of senility.

The remedy in minute doses acts directly upon the organs of the chest. It overcomes and prevents pulmonary engorgement. It quiets the **cough** of **phthisis**, strengthens the patient, moderates the **diarrhœa** in these cases, and removes **chest pains**. It is a valuable agent in **dyspnœa**, whatever the cause, whether of heart faults or disorders of the lungs. For stitches in the chest of a neuralgic or inflammatory character, it is specific. It is valuable in **bronchitis**, **pneumonitis** and **pleuritis**, with the indications of increasing weakness, sharp stitchlike pains, and short, dry, hacking cough. For intercostal neuralgia it is very sure.

Beyond these indications it has been used successfully in many cases of malignant jaundice. Its direct influence on the urinary apparatus is to induce **diuresis** with relief of existing irritation. It relieves vesical and prostatic irritability, especially if from sexual excesses. It has been used with good results in psoriasis, lupus, eczema and acne.

Toxicity—The eating of match-heads by children induces poisoning. An overdose of the agent in medicinal form induces it. The symptoms are a peculiar taste in the mouth and the odor of the substance on the breath. There is burning pain throughout the gastro-intestinal tract. There is vomiting and purging of matter which may be luminous in the dark. Symptoms of gastro-intestinal inflammation rapidly follow, involving the intestinal and glandular organs. The condition of the liver, post-mortem, is similar to that of yellow atrophy, although at first it may be enlarged. There is fatty degeneration of all organs. Jaundice will finally occur, with vomiting of coffee-ground matter. There is obstinate constipation, with clay-colored feces. Muscular twitchings, vertigo, extreme headache, delirium, becoming wild; spasms, unconsciousness and death ultimately follow. The urine becomes dark-colored, scanty and albuminous, with fatty casts.

In parties subjected to constant contact with Phosphorus a

chronic form of poisoning occurs, as necrosis of bone, beginning with necrosis of the inferior maxilla. It is said none are safe from an attack if they work two years in Phosphorus.

Antidotes—If Phosphorus has been recently taken, the stomach must be evacuated at once. An old ozonized oil of turpentine is the physiological antidote, but it can seldom be obtained, and the fresh oil or other oils will facilitate the absorption of the agent. The permanganate of potassium is a correct antidote. Dilute solutions of this, or of the peroxide of hydrogen, may be administered.

The after effects must be met with stimulants, tonics and restoratives as are indicated.

In the treatment of **chronic poisoning**, the patient must be entirely removed from the cause, and restoratives as indicated used. Elimination is essential. The kidneys should receive much attention, and if not diseased should be stimulated to free activity. Vegetable alteratives will be of much service.

ACIDUM PHOSPHORICUM.

Formula— H_3PO_4 .

Synonym—Phosphoric acid.

Occurrence—A concentrated acid, made by dissolving four hundred and thirteen grains of phosphorus in six ounces of nitric acid. This is reduced by careful evaporation to two fluid ounces. To this distilled water is added until it measures, when cold, three fluid ounces.

Description—This acid is a colorless liquid, almost odorless, and with a strongly acid taste.

Glacial phosphoric acid is obtained from calcined bones by the action of sulphuric acid; it occurs as a white uncrystallized fusible solid, with a very sour taste and without odor. Sparingly soluble both in water and alcohol.

Neither of the above forms of Phosphoric Acid are used in medicine to any great extent.

Dilute Phosphoric Acid is formed by the addition of three and one-half ounces, by weight, of phosphoric acid, to twenty-six and one-half ounces, by weight, of distilled water. This contains ten per cent of absolute orthophosphoric acid.

This process results in the formation of a colorless liquid, with powerful acid properties. It does not, however, possess the corrosive action of other mineral acids.

Physiological Action—This agent in its physiological action resembles phosphorus only in a general way. It is a stimulant and sedative to depressed irritable nervous conditions when an acid is indicated in the system. It allays pain and distress of a subjective character probably more or less imaginary, present

with hysterical conditions, and also in irritable patients suffering from nervous exhaustion.

Therapy—The agent is an excellent remedy for the so-called **nervous dyspepsia**. It adds tone to the nervous structure of the stomach, digestive and assimilative organs, materially aiding these functions. Its influence as a nerve sedative and tonic may be partially due to this stimulating influence over general nutrition.

Phosphoric acid stimulates the **sexual function**, increasing the tone of the ovaries and testacles, overcoming in some cases spermatorrhœa. It corrects certain abnormal urinary sediments, rendering insoluble phosphates soluble, and easy of elimination.

Given in the manner advised for aromatic sulphuric acid in low forms of **fever** or in violent **inflammatory fevers**, with typhoid symptoms, it not only acts as a stimulant to the functions of nutrition, but it apparently increases nerve force. This fact is most important. It thus increases the force of the heart's action, giving strength and volume to the pulse. In none of these effects, however, is it equal to phosphorus properly administered.

AVENA,

AVENA SATIVA.

Synonym—Oats.

Part Employed—The seed.

Natural Order—Graminaceæ.

Locality—America, Europe, Asia. Cultivated.

Botanical Description—*Avena sativa*, or common Oats, is an annual plant cultivated for the seed as a food-stuff in all northern temperate latitudes. It has a smooth stem from two to four feet high, with linear-lanceolate, veined, rough leaves; with loose striate sheaths; panicles loose, with two and occasionally three-flowered spikelets, large, drooping; the palea somewhat cartilaginous, closely investing the grain; one flower, with a long, twisted awn on the back, the others awnless; fruit lanceolate, pointed, grooved on the inner side. The ground seeds have a bitterish taste. Solvents, alcohol, water. Dose, from ten to thirty grains.

CONSTITUENTS—Avenin, fixed oil.

PREPARATIONS—Specific *Avena*. Dose, from five to sixty minims. Concentrated Tincture *Avena*. Dose, from five to thirty minims.

As a nerve stimulant and permanent tonic this valuable agent is comparatively unknown. The writer takes the responsibility of introducing it here through the confidence acquired by observing its prompt and satisfactory action during an expe-

rience of twenty years in the treatment of nervous diseases. There are many well-known and lauded agents that are hardly to be compared with this for prompt action upon the nervous system.

Administration—*Avena Sativa* should always be given in appreciable doses of the tincture. Fifteen drops, three or four times daily, well diluted, will usually meet the case. It may be given in doses of from five to sixty drops in rare instances. It should, however, never be given in larger quantities than twenty minims unless the patient is thoroughly accustomed to the remedy, and has found the usual dose insufficient. Otherwise there is danger of obtaining the physiological effect of the drug, which is announced by pain at the base of the brain. When this symptom makes its appearance the medicine should be discontinued for a day or two, and then given in reduced doses.

If administered in hot water during the day, its action is much quicker, and in cold water at night on retiring it has a more extended influence. When given in hot water its action is almost instantaneous.

Physiological Action—Its selective influence is directly upon the brain and upon the nutritive functions of the organism, increasing nerve force and improving the nutrition of the entire system. The influence of a single full dose is promptly felt, similar to the influence of any active stimulant, but more permanent. It is a stimulant, sedative and direct nutritive tonic, apparently restoring the wasted elements of nerve force.

Specific Symptomatology—In general neurasthenia it promptly relieves the almost unbearable **occipital headache**, so constant, and evidenced by an enormous waste of the phosphates in the urine, common with nervous exhaustion.

It is a remedy of great utility in loss of nerve power and in muscular feebleness from lack of nerve force.

In the overworked conditions of brain workers—ministers, physicians or lawyers—in the **general prostration** from great anxiety and worry, it acts in the same lines as phosphorus and in many cases fully as satisfactorily. In **sexual neurasthenia** it is the remedy *par excellence*, as it has a selective influence upon the nerve structure of the genito-urinary apparatus.

Therapy—It will be found directly serviceable in paralysis and wasting disease of the aged, in **nerve tremors**, and especially in **chorea** and in **paralysis agitans**. It has been beneficial in **epilepsy**.

In the **convalescence of prostrating disease**, and during the **asthenic** or later stages of inflammatory and **exanthematous disease** and **diphtheria**, it is as important as quinine and strychnia, and certainly as reliable.

The local paralysis of diphtheria has no better antidote, and

if given in hot infusion during the course of acute exanthematous disease it quickly determines the eruption to the surface and promotes convalescence.

Because of its selective action upon the nervous structure which supplies the reproductive organs, it will be found to allay nervous excitement, nervous **palpitation** of the **heart**, insomnia and mental weakness, or failure and general debility caused by **masturbation, over sexual indulgence, or onanism**. It is a sovereign remedy in impotency. This writer has had better satisfaction in the use of this agent in the impotence of young newly married men, than from any other single remedy or combination of remedies.

If there is prostatic or other local irritation, a combination of this agent with saw palmetto will cover the entire field.

In **uterine or ovarian disorders with hysterical manifestations** it is of much service. The nervous **headaches** of the **menstrual epoch**, especially those accompanied with burning on the top of the head, and sick headaches apparently from disordered stomach at this time, or in fact sick headache at any time if accompanied with nervous weakness, are all promptly benefited by *Avena Sativa*. In atonic **amenorrhœa** with great feebleness, it is valuable. In neuralgic and congestive dysmenorrhœa, with slow and imperfect circulation and cold skin and extremities, it is an excellent remedy.

There are probably but few single remedies that will compare with this in restorative power in its influence in overcoming the **habits** of alcohol, tobacco, morphine and opium. It will greatly enhance the value of all other prescribed agents.

In the treatment of the **morphine habit**, an eminent homœopathic authority gives the following directions:

In most cases in which the habitue has not used more than four grains daily, the opiate may be abruptly discontinued, and even substituted, without any serious results. If a larger quantity than this amount has been taken for some time, it is better to gradually reduce the daily dose of morphine in the usual manner, simply prescribing the *Avena* in addition. The latter should be given in the same dose, as a rule, regardless of the amount of morphine taken. In other words, it is not necessary to increase the *Avena* as the opiate is withdrawn. When the quantity of morphine has not exceeded four grains daily it should be stopped at once, as stated above, and *Avena* given in its stead in fifteen-drop doses, four times a day, in a wineglassful of hot water. By this method the disagreeable after-effects will be much less than though the dose of morphine is gradually reduced, and the patient will find life quite bearable, as a rule, at the end of a week.

Co-operatives—It works in harmony with strychnia in its stimulating influence, but is more permanent in its effect. It

exercises an influence similar to quinine after prostrating fevers and is similar to coca and phosphorus in its restorative powers. *Xanthoxylum* will enhance its general stimulant influence, and it may be combined with *cimicifuga* and *exalgin* in chorea. It is antagonized by nerve depressants and nerve sedatives which exercise no stimulant or restorative influence.

There is no danger of forming the habit of taking the drug, as it can be suddenly abandoned at any time without evil consequences, even when given in large quantities.

COCA.

ERYTHROXYLON COCA.

Parts Employed—The leaves.

Natural Order—Linacæ.

Locality—Peru, Chili, Bolivia.

History—The Coca grows in moist places on the eastern slips of the Andes, and is used by the natives as we use tea and coffee or is chewed like tobacco.

Botanical Description—*Erythroxylon* Coca is a small shrub, four to six feet high, with spreading branches, wrinkled bark of purplish-brown color, twigs smooth, leaves ovate, alternate, thin, coriaceous, entire, reticulated, petiolate, midrib prominent, having on the under side a slightly curved line extending from one end of the leaf to the other; surface of leaf dark green above, paler beneath, one to two inches long, half to one inch wide; flowers small, white, in clusters upon branches in places where the leaves have fallen, bracteated, petioled, sepals five, petioles five, oblong, concave, filaments longer than the pistil, ovary three-celled, three-seeded; styles three; fruit an oval drupe, half an inch long, red, one-seeded; nut oblong, furrowed. Solvent, dilute alcohol. Dose, fifteen grains.

CONSTITUENTS—Cocaine, cinnamyl-cocaine, truxil-cocaine, hygrine.

PREPARATIONS—*Extractum Cocæ Fluidum*, Fluid Extract of Coca. Dose, from one-half to one drachm. *Specific Coca*. Dose, from one to twenty minims.

Physiological Action—The natives of South America and laborers in that country use Coca, chewing the leaves, much as tobacco is used in other parts of the world. It abolishes the sensation of hunger for a time. This may in part be accounted for by its producing anæsthesia of the nerves of the stomach. It does not take the place of food. It increases the powers of endurance and confers a singular immunity from the suffering incident to privation and excessive physical exertion. These effects are accounted for, in part at least by the anæsthetic effect of cocaine, which is its principal constituent. In large doses it increases the animal heat and quickens the pulse and

respiration. By increasing the dose the nervous system is excited, with increase of desire for muscular exertion; while in poisonous doses it causes delirium, hallucinations and congestion of the brain. The general effect of Coca is to stimulate the nervous system and retard retrograde metamorphosis. The prolonged use of the drug causes a degeneration of the nervous system characteristic of narcotics, though when used in moderation this effect is not observed.

Few drugs have as interesting and as remarkable a history as Erythroxyton Coca.

The Coca leaf is a great source of enjoyment and comfort to the Peruvian Indian; it is to him what the betel is to the Hindu, kava to the South Sea Islander and tobacco to the rest of mankind, but it produces invigorating and permanently restorative effects not possessed by other stimulants.

However, we would premise our remarks with the caution that the influence of Coca on the native habitue of the tropics, and its influence upon the civilized inhabitants of the temperate zones are very different influences. Its continued use among the latter is most serious, inducing habits as degrading and as pernicious as the use of opium and alcohol, and as fatal to mental and physical integrity.

The effects attributed to the drug are only what might be expected from the action of so powerful an alkaloid as is contained in the Coca leaves.

Therapy—There are few cases of **neurasthenia** in which this agent will not be found useful. Taken after dinner, it serves often to facilitate digestion, and even confirmed dyspeptics find their distressing symptoms relieved by it. It is of especial value in cases where exhausting mental labor has led to **morbid depression** of spirits. It is valuable in all cases of despondency. It relieves the **nervous irritability** that follows overindulgence of any kind, restoring the capacity for work and renewing the energy.

It acts to an extent as an antidote to the effect of opium, alcohol, tobacco or coffee, and judiciously used is said to enable one to overcome the morbid craving for any of these stimulants when they have been used to excess.

It is used by public speakers and singers, who have found themselves in better voice after using it.

As a remedy for **nausea** and **vomiting** from reflex causes, particularly in the vomiting of pregnancy, the cordial proves extremely efficacious. For this purpose it should be taken a few moments before meals, and the dose repeated in an hour or so afterwards. **Gastralgia** is frequently relieved by this remedy, and **nervous headaches** often disappear under its use.

It is of service also in cases of **asthma**. It is an **aphrodisiac** and **emmenagogue**. It is an antiperiodic. Internally and lo-

cally it has been used for **hemorrhoids**. As a restorative in feeble heart it is of much value.

KOLA.**COLA ACUMINATA.**

Synonym—Kola nut.

Part Employed—The seed.

Natural Order—Sterculiaceæ.

Local ty—Soudan, Western Africa.

Botanical Description—The Kola tree grows wild in the tropical portion of Western Africa, is about thirty feet high, branches smooth, cylindrical; leaves from three to six inches long, one to two inches wide, oblong-acuminate, tapering at the base; margins entire, sinuous or revolute, smooth; flowers numerous, polygamous, in terminal and axillary panicles; fruit of five follicles, six to twelve seeds in each follicle; fruit coriaceous or woody, smooth, three to six inches long, two to three inches thick.

The tree bears at the fourth year, but does not reach its perfection until the tenth year, when it yields about 120 pounds of seeds in each year.

CONSTITUENTS—Caffeine, Theobromine, tannin, fat, sugar, starch, gum.

PREPARATIONS—Extractum Kolæ Fluidum, Fluid Extract of Kola. Dose, ten to thirty minims.

It is prepared by different manufacturers in the form of wines, cordials or elixirs. A solid extract is also prepared.

Physiological Action—The natives of the western portion of tropical Africa use the seeds of Kola most extensively to overcome fatigue, to support the strength on long marches, and to overcome depression of spirits and melancholy. It is most highly esteemed and is in as common use as tea, coffee and cocoa in civilized countries, closely resembling the first two named.

The agent sustains physical strength to a remarkable degree. It is a tonic to the heart, increasing the strength of its impulse; it regulates the pulse, increases arterial tension, induces diuresis, but retards tissue metabolism. It is a stomachic tonic, inducing a normal appetite and good digestion. It restores normal action in debilitated conditions of the intestinal tract.

Therapy—It is used in **neurasthenia** and **hysteria**, characterized by great mental despondency, foreboding, brooding, more of a quiet or silent character. It is especially indicated if the heart is feeble and irregular in its action, with general muscular feebleness. In **cerebral anæmia** it is indicated and is an excellent auxiliary in general anæmia. It is an excellent restorative after prostrating **fevers** and protracted exhausting disease. It is of specific value in **melancholia**.

In **weak** and enfeebled conditions of the **heart** muscle, with valvular weakness, dyspnœa, irregular action, it is of benefit, the influence being quickly exhibited on the pulse, and an improved sense of well-being experienced.

It is recommended as a substitute for alcoholic drinks, and has been used to most excellent advantage as a stimulant and restorative in the treatment of the drink habit. Those most enthusiastic claim that it alone will cure **alcoholism**.

It is advised in **chronic diarrhœas**, with great lack of tone. It has been used in **sea sickness**, one ship surgeon claiming that he had used it on many voyages, and had found it to relieve even the most susceptible, in many cases. The agent is not yet in general use, but is without doubt a valuable one in its field.

COFFEE.

COFFEA ARABICA.

Part Employed—The fruit.

Natural Order—Rubiaceæ.

Locality—Arabia, Africa.

Botanical Description—The Coffee tree is an evergreen, indigenous to tropical Africa, growing in the wild state to a height of twenty feet, but by cultivation is trimmed down to five or six feet. In general appearance it resembles a cherry tree, bark smooth, grayish, branches numerous, opposite; leaves ovate-oblong, acuminate, shining on upper side, wavy, deep-green and glossy above, paler beneath, four to six inches long, one-half to two inches wide; flowers small, white, sweet-scented, funnel-shaped, in clusters of three to seven; calyx five-lobed; stamens five, inserted in the upper part of the tube; one pistil with a bifid style; fruit oval, one-half inch long, deep-purple when ripe; two-seeded drupe, succulent, endocarp thin, enclosing two plano-convex seeds, which are placed together by thin flat sides and constitute the raw coffee of commerce.

CONSTITUENTS—Caffeine, volatile oil, Caffeotannic acid, proteid, dextrin, glucose.

PREPARATIONS—Specific Coffea. Dose, one to ten minims. Caffeina Citrata, Citrated Caffein. Dose, three to eight grains. Caffein. Dose, one to five grains.

Physiological Action—Coffee being in common use as a beverage, its effects are well known. The process of roasting, which must be conducted with a heat not above 482 deg. Fahr., destroys the sugar, fat and tannin and produces an agreeable aroma, probably due to a volatile oil.

Poisonous doses of Coffee or Caffeine cause delirium, semi-consciousness, a slow and irregular pulse, cold extremities and cold, clammy perspiration, lowered temperature, anæsthesia,

cramps, tremors, a reeling gait, convulsions, dimness of vision, increase of urine. The habitual and excessive use of Coffee as a beverage causes indigestion, with acidity, cardiac irritability, vertigo, headache, irritability of disposition and despondency.

Therapy—The tincture of coffee made from the unroasted berries is a **nerve stimulant** and **antispasmodic**. It increases the heart's action and produces a rise in arterial tension. It is of value in nervous headache, and in vertigo from imperfect circulation in the nerve centers—in cerebral anæmia.

Coffee is used as a **stimulant** to antidote the effects of **narcotic poisons**. In opium poisoning its effects are prompt and immediate. A strong decoction is prepared and injected within the rectum, if impossible to administer it per os.

CAMPHOR.

CINNAMOMUM CAMPHORA.

Location—Japan, China, Formosa.

Occurrence—A concrete volatile oil (stearopten), obtained from the Camphor Laurel, purified by sublimation.

Description—It occurs in tough crystalline masses, white and translucent; easily powdered in alcohol or chloroform; a characteristic aromatic odor, and pungent aromatic taste; slightly soluble in water, freely soluble in alcohol, ether, chloroform, and in the fixed and volatile oils.

Physiologic al Action—In its influence there is something of a diversity of opinion concerning the method of action of this agent. It is certainly a sedative with power to increase the tone and improve the functional activity of the nervous system.

Therapy—It has long been used in **hysteria** to control the attacks and to relieve the nervous excitement, restlessness, nervous depression, melancholia and hypochondria. In sudden **depression** from exhaustion and the conditions of depression consequent upon neurasthenia, it serves a good purpose.

In all forms of **nervousness** in women and in children and in the feeble it has long been in common use. In the excitable **mania** of exhausting fevers, it serves a useful purpose. It allays nervous excitement and produces a general tranquility of feeling.

It is a sovereign remedy for **acute coryza**—"cold in the head," and may be inhaled or taken internally. In acute and chronic catarrh it has a tonic yet soothing effect upon the mucous membranes. It controls hypersecretion and restores normal functional action.

These facts are also true in catarrhal **bronchitis**, in **asthma** and in **whooping cough**. In these spasmodic coughs the antispasmodic influence of the agent is of prime importance.

It is of service when added to cough syrups as a stimulating sedative in the persistent coughs of capillary bronchitis.

It has a marked **anaphrodisiac** influence, and has been given freely in nymphomania, satyriasis and erotomania. Its influence in controlling sexual excitement is positive. It cures priapism, chordee, and in a general way reduces the power of erection and the sexual appetite. In sexual weakness and in nocturnal emissions accompanied with erotic excitement from over indulgence, with violent erections, it is of much use and may be combined with ergot to equalize the circulation of the organs.

It is a stimulating diaphoretic in fevers, and in inflammatory disorders with suppression of the sudoriferous glands. This is especially true in exanthematous fevers, and where there is mania in prostrating fevers. Its influence is marked in adynamic fevers where there is feeble, rapid heart action and irritable pulse, with dry skin and muttering delirium, with subultus tendinum. It has a diffusing, stimulating influence in these cases which is of value.

It is combined with opium and ipecac in the well known **Diaphoretic Powder**, in the proportions of one part each of camphor, opium, and ipecac, with seven parts of the potassium sulphate. The dose is from two to ten grains.

It is a stimulating antiseptic of much value when applied to **wounds**, or applied externally. It is applied in mild forms of neuralgia, especially of superficial nerves, to toothache, to local swellings and inflammations, in **lumbago**, in myalgia, and in **tic douloureux**. It is positively useful in suppressing the secretion of milk, when from inflammation or other cause this becomes necessary. There are but few remedies better. It soothes pain and distress, and assists in controlling any existing inflammation.

Alexander, of Berlin, advises one part of camphor dissolved in nine parts of olive oil to be used hypodermically in chronic lung disorder. He found from three to five injections each day of a few drops produced excellent results in the last stages of **phthisis pulmonalis**. It supported the strength, relieved disagreeable sensations, controlled night sweats and the irritating cough, and diminished the expectoration, and to a certain degree the diarrhœa. **Camphoric acid** is in good repute as an agent to control **night sweats**.

The agent has long been of very general use, but is now being superseded in some lines of its operation by agents which possess all of its influence in a more active manner, and are capable of pleasanter administration. This is especially true in the more severe nervous conditions.

In a concentrated form, in a full dose, it is an active stimulant and will overcome chill and depression and restore warmth, increased power of the circulation, without increasing the pulse rate, and increases the activity of the excretory function of the skin and of the kidneys.

Carbolate of Camphor.

A proprietary remedy known as campho-phenique or carbolate of camphor has recently become popular as a dressing for wounds, an antiseptic of much value, and as a stimulant to healthy granulation. It may be prepared by any pharmacist by the following process:

One part (by weight) of carbolic acid is added to three parts of camphor. This is set aside for twenty-four hours and then strained through gauze. It is a permanent liquid, having a specific gravity of .990. It is thoroughly antiseptic, and possesses unsurpassed germicidal powers. It is used to impregnate gauze and cotton, to be used as dressings for wounds. It combines readily with alcohol, ether, fixed and essential oils, and petroleum derivatives, but not with aqueous solutions, or glycerine. It readily dissolves menthol, cocaine, salicylic acid, iodoform, chloral hydrate and mercuric chloride. Where applied to inflamed or ulcerating mucous surfaces it causes smarting for a moment, and then relieves existing pain and acts as an antiseptic stimulant. Mixed with cotton-seed oil, it forms a valuable dressing to incised, lacerated or contused wounds, preventing suppuration.

If applied after the suppurative process is established, it will change the character of the discharge, removing all fœtor. In vaginitis, vulvitis and pruritus vulvæ, when applied to the vagina, on cotton which is kept in place for twenty-four hours, it relieves all distressing symptoms. After parturition a small quantity may be poured on the cloths which are applied to the vulva, to take up the discharges. It will remove all disagreeable fœtor, and relieve soreness if ordinary cleanliness and proper changes are made. It is also a valuable application in cases of frost bite. It may be used wherever an unirritating antiseptic is indicated.

CAMPBOR MONOBROMATE.

Synonym—Monobromated Camphor.

Occurrence—Formed by heating bromine and camphor in a sealed tube on a water bath. The crystalline product is dissolved and recrystallized, first from water, then from alcohol.

Description—Prismatic crystals, colorless, with the odor and taste of camphor, permanent, soluble in alcohol, ether and chloroform, insoluble in water.

Dose from one-tenth to five grains.

Administration—For children a good preparation is made by taking one part of the crystals and triturating it thoroughly with nine parts of the sugar of milk. Of this one grain may be given every hour to a child of two years.

Physiological Action—The agent has the properties of a stimulating sedative, exalting the nervous functions when depressed, when there is great restlessness, excitability or delirium. It has marked anodyne and hypnotic properties under proper circumstances.

Therapy—It is prescribed in **nervous excitement** or extreme restlessness accompanying inflammatory disease or protracted fevers. It is specific in nervous irritation from reflex causes.

It is an excellent remedy for children with the long train of symptoms resulting from irritation of the dental nerve.

The indications are diarrhoea, nausea, great restlessness, fullness of the circulation of the head, with heat, sleeping with half open eyes, rolling of the head, and tossing, crying out with little sharp cries. These symptoms occur at any time during development of the milk teeth.

In fully developed cases of cholera infantum, with the extreme symptoms of involuntary watery discharges, cold extremities, pinched features, emaciation, apparently uncontrollable vomiting, this agent is given in full doses, and it will often meet alone the whole train of indications.

It is a hypnotic when fever and general distress induce wakefulness.

In **delirium tremens** it has produced good results, and in mild cases of the **delirium** of protracted fevers, with restlessness, it will be found of advantage.

It has been used in **chorea**, and in hysterical manifestations of an excitable character, and in nervous **palpitation**, and irregular heart action from reflex irritation.

MYRRH.

COMMIPHORA MYRRHA.

Part Employed—A gum resin obtained from the balsamodendrons.

Natural Order—Burseraceæ.

Botanical Description—A small, bushy tree, with a grayish white bark; branches at right angles, knotty, irregular, abortive, terminating in spines; leaves smooth, blunt, obovate, trifoliate, half an inch long, central leaflet much the largest; fruit oval, lanceolate or pyriform, furrowed longitudinally, brownish; the juice, concreted spontaneously on the bark, occurs as irregular brownish-red tears or small masses, with a balsamic odor, and taste, bitter, acrid. Solvent, alcohol. Dose, from five to thirty grains.

CONSTITUENTS—Volatile oil, Myrrhol, Glucocide, resin, gum.

PREPARATIONS—Tinctura Myrrhæ, Tincture of Myrrh. Dose, from five to thirty minims. Tinctura Aloes et Myrrhæ. Tincture of Aloes and Myrrh. Dose, from twenty minims to two drams.

Physiological Action—A stimulant to the nervous system, with tonic properties. A stimulant with local action upon mucous membranes and glands and glandular organs; antiseptic. In overdoses, emetic and actively cathartic, decreasing bronchial secretion.

Specific Symptomatology—Myrrh is specifically indicated in a general sense where there is adynamia or extreme asthenia, with weak, inefficient capillary circulation, cold skin, weak pulse and deficient circulation.

It increases the power and frequency of the heart and respiratory action, and conduces to a general sense of warmth and increased vigor.

Therapy—This agent has always been highly esteemed as a stimulant, although its influence is more of a local than of a general character. It exercises the characteristic influence of most of the stimulants upon the excretions and secretions, acting as a diaphoretic expectorant, sialagogue, and to a certain extent emmenagogue.

It was once popular in the compound tincture of capsicum and myrrh. As a most active general stimulant in ulcerative, engorged, flabby and **atonic conditions** of the **mucous membranes** of the **mouth** and throat this agent acts promptly. It stimulates the capillary circulation, restores tone and normal secretion and causes the healing of ulcerations. It is useful in sore mouth of all kinds, and especially in syphilitic sore mouth and sore throat. It may be combined with other washes or gargles or it will act promptly alone.

It will quickly cure the beginning of **syphilitic ulcerations** in the throat and mouth. In the **spongy gums** and **aphthous sore mouth** of children, in **somatitis materni** if combined with an alterative and tonic astringent it will assist in the cure of the very worst cases without taking the child from the breast. An infusion made of white oak bark, yellow dock root and Myrrh, to which may be added a mild antiseptic, as baptisia, echinacea, or boric acid, will cure the most intractable cases of this latter named disease. Myrrh is excellent in the sore mouth and extreme ulceration of **mercurial pyalism**.

In its influence upon the **digestive apparatus** Myrrh is direct in its action. It quickly increases the power of the digestive function, stimulating the peptic glands to extreme action. It increases the appetite and promotes the absorption and assimilation of nutrition. It is given in **atonic dyspepsia** in the absence of inflammatory action, especially if there is excessive mucous discharge from the bowels.

It is exceedingly useful in the **apepsia** and extreme inactivity of the stomach in alcoholics, either alone or combined with capsicum.

While it is expectorant, and stimulates the secretion from

the mucous membranes when inactive, it influences to a satisfactory extent the restoration of the function of these membranes when the secretion is excessive, as in **catarrhal conditions**. In deficient or excessive action it restores the normal condition.

In **debilitating expectoration** of phthisis pulmonalis it suppresses secretion and increases the patient's power to throw it off. In excessive mucous secretion from any organ it has a direct influence. In atonic catarrhal diarrhœas of a subacute or chronic character its influence is specific and satisfactory.

In some cases of **catarrh** of the **bladder** it is used internally, and in the irrigation fluid also. It is valuable in **prostrating leucorrhœa**.

It is an old popular remedy in **amenorrhœa** given in combination with aloe and iron, especially in chlorotic and anæmic patients. It has long been in use in the old school for this purpose. It may be combined also with macrotin to a good advantage.

MOSCHUS.

MUSK.

A penetrating, odoriferous, granular substance obtained from the preputial follicles of the musk deer of the Himalaya mountains in Central Asia from China to Tibet.

Tincture Moschi, Tincture Musk. Dose, from twenty minims to two drams.

Therapy—This agent is a powerful diffusible stimulant, anti-spasmodic and aphrodisiac. It produces symptoms similar to those of alcoholic stimulation. It is used to overcome collapse and as a stimulant in all profound depressed conditions. It is useful either in nervous excitement or depression, if induced by exhaustion. It is a remedy for extreme exhaustion following severe **prostrating fevers** at the time of collapse.

As an **antispasmodic** it is used for **hiccough**, **whooping cough** and other spasmodic coughs, and in **hysterical convulsions** and in the convulsions of childhood. It is similar in its action to camphor, asafetida, valerian and ammonia.

CHAPTER III.

STIMULANTS WHICH DIRECTLY INFLUENCE THE CIRCULATION.

BELLADONNA.

HOMATROPINE.

CALABAR BEAN.

ATROPINE.

STRAMONIUM.

JEQUIRITY.

DUBOISIA.

BELLADONNA.**ATROPA BELLADONNA.****Synonym**—Deadly nightshade.**Parts Employed**—The leaves and the root.**Natural Order**—Solanaceæ.**Local ty**—Europe.

Botanical Description—Belladonna is a perennial herb, growing in stony mountainous regions, among ruins and along walls. It blossoms from May to August. Height from four to six feet; stem round, thick, purplish, erect, dichotomous branched, leafy, slightly downy; leaves ovate, oblong, four to six inches long, and two to four inches broad, attached by a short foot stalk, in pairs of unequal size tapering at the apex, entire, smooth, thin, upper surfaces brownish green, lower surfaces grayish green, both whitish, punctate, from cells containing crystalline powder; flowers imperfectly axillary, solitary, one inch long, drooping, bell-shaped, dark purple on the border, pale downward; fruit, a two-celled, many-seeded berry, roundish, with a longitudinal furrow on each side, purplish black, containing a sweetish violet colored juice; root, thick, fleshy, branched.

The roots should be collected, when at least three years old, from the plant while in flower in the autumn. When dry they are of a brownish-gray color externally, whitish internally, eight to twelve inches long, a half to one inch thick, longitudinally wrinkled, fracture smooth, mealy; bark thick, with a covering of brownish-gray cork; wood in broad wedges and equally wide medullary rays, nearly inodorous; taste sweetish, then bitter, acrid. Solvent, alcohol. Dose, one grain.

CONSTITUENTS—Atropine, Atropamine, Belladonine, Atrosin, Hyoscyamine, Cholin, Asparagin, Chrysatropic and Succinic acids.

PREPARATIONS—Atropinæ Sulphas, Atropine Sulphate. Dose, 1/120 to 1/60 of a grain. Extractum Belladonnæ Foliorum Alcoholicum, Alcoholic Extract of Belladonna Leaves. Dose, one quarter to one-half of a grain. Tinctura Belladonnæ Foliorum, Tincture of Belladonna Leaves. Dose, from one to thirty minims. Extractum Belladonnæ Radicis Fluidum, Fluid Extract of Belladonna Root. Dose, from one to five minims. Specific Belladonna. Dose, from one-twentieth to one minim.

Administration—This latter preparation is the most stable and reliable of all the preparations of Belladonna. It is deprived of chlorophyll, which imparts a green tint, is of a light wine color and of permanent strength. Ten minims in four ounces of water, a teaspoonful every hour, is usually of sufficient strength for an adult. The dryness of the throat, the appearance of bright-red areas on the skin of the neck and face, or dilatation of the pupils denote an overdose. Much larger doses are necessary to produce these results where there is profound congestion.

In acute cases with children, five drops of specific Belladonna or ten drops of the tincture may be dropped into four ounces of water, and a teaspoonful given every hour. The tincture in drop doses may be given to adults.

The fluid extract varies so much in the product of different manufacturers, and the same product varies so much on standing, that it is not a safe preparation for internal use. The extract is given in pills in doses of from one-tenth of a grain to one grain.

Solutions of Atropine for hypodermic use should always be made fresh. Old solutions are to be avoided. The fluid becomes infected, and the alkaloid is partly destroyed.

Atropine.

Atropine is the essential alkaloid of belladonna. It is difficult to obtain, entirely free from hyoscamine.

Description—It occurs as a white crystalline body, usually in minute acicular crystals, or as an amorphous white powder of a bitter, acrid, nauseous taste and odorless. Upon exposure to the air it assumes a yellowish color. It is soluble in 130 parts of water and three parts of alcohol, 50 parts of glycerine and quite freely in ether and chloroform.

Atropine Sulphate.

Description—This salt is perhaps more commonly used in medicine than the unsaturated alkaloid, atropine. It is a white crystalline powder, odorless and permanent. It is freely soluble in water and in alcohol, nearly insoluble in ether and chloroform.

Therapy—The uses of Atropine or Atropine Sulphate are those of belladonna. Their concentrated form greatly increases the violence of their action. Belladonna is in every way preferable for internal use. These alkaloids are of much advantage in narcotic poisoning and as stimulants in the recovery of patients, from shock. The 1/100 of a grain will produce the physiological symptoms in a healthy patient. This dose is sel-

dom exceeded. From $1/150$ to $1/200$ is usually sufficient. The $1/50$ of a grain is the maximum dose. They are best used hypodermically.

Atropine is used to **dilate** the **pupil** in examination of the interior of the eye, and it is useful in acute inflammation of that organ. It empties the capillaries of an excess of blood, abating the inflammatory processes. It prevents adhesions in iritis, and assists in breaking up any that may have occurred. Two grains of Atropine are dissolved in an ounce of distilled water, or better yet, in an ounce of castor oil deprived of its ricinic acid. From one to five drops of these solutions may be instilled into the eye. The oleaginous solution has advantages over the aqueous solution.

Physiological Action—In its full primary influence **belladonna** is a cerebral excitant, promoting active cerebral hyperæmia—a profoundly full but active condition of the cerebral capillary circulation. This is evidenced by restless excitation, mental exhilaration, headache, dilated pupils, intolerance of light, impairment of vision, uncertainty of muscular movement, finally amounting to inco-ordination, with motor paralysis. There is delirium of a talkative, and in some cases violent, and, perhaps, furious character, with illusions and hallucinations. In fatal doses there may be finally profound stupor after the extreme delirious excitement, with feeble pulse, cold skin, shallow respiration and death. It paralyzes the inhibitory nerves of the heart, and finally the heart muscle. It first contracts the blood vessels, diminishing the amount of blood in the spinal cord and increasing the arterial pressure. Its extreme after-effects are dilatation of the vessels, with reduced tension. It acts powerfully on nonstriated muscular fiber in the intestinal canal, increasing peristaltic action.

Belladonna acts directly upon the heart. It produces increased action, with full and slower pulse, and often a distinct and salutary rise in the temperature. It increases arterial tonus and induces extreme activity of the capillary circulation. This is apparent when given in cases of profound congestion, as in congestive chill, with cold relaxed skin, covered with cold sweat, dilated pupils, difficult breathing from pulmonary congestion, rapid, small, compressible pulse and deathlike pallor. A full hypodermic of $1/80$ to $1/60$ of a grain of atropine will in a short time effectually overcome the entire train of symptoms.

It is a better remedy in a case of this character than strychnia, as the influence of strychnia is expended upon the nerve centers and is more centralized, while the influence of this agent is extended from the nerve centers to the peripheries, directly influencing the capillary circulation at the peripheries in a marked manner. No stimulating influence could be more general—more diffused, than this. It increases respiration,

actively overcoming pulmonary congestion. Rapidly moving the blood in the lung-cells, it permits increased oxidation. It can be depended upon to preserve this influence continuously, if the doses are not too large, but hyperstimulation must be avoided. A full dose of Belladonna or Atropine so rapidly fills the capillary circulation of the skin as to produce a rash—a characteristic redness of the skin closely resembling that of scarlatina, but lacking the punctated appearance of that eruption. Desquamation will follow this artificial exanthema in some cases, and as a dryness and redness of the throat is induced at the same time, with difficult and distressing deglutition, the resemblance to scarlatina simplex is most striking.

Belladonna exercises an invariable influence in suppressing secretion, not only from the skin and mucous membranes, but from the glandular organs as well. In small doses this influence does not interfere with its usefulness in overcoming capillary blood stasis, as its influence upon the circulation precedes its influence upon the secretion.

Specific Symptomatology—In prescribing Belladonna, its specific and invariable influence in **antagonizing congestion** must always be borne in mind. Its influence in restraining secretion need not prevent its administration in conditions where there is capillary stasis, as in acute congestion or inflammation, in small medicinal doses its beneficial influence in equalizing the circulation much more than compensates for the temporary retardation of secretion. Combined with aconite, this influence upon secretion is not so apparent.

In acute cases the indications for Belladonna are chilliness, with mental dullness and inactivity, dull eyes with dilated pupils, eyes partly opened when asleep, skin cool and relaxed, with sluggish capillary circulation and cold extremities.

Therapy—Belladonna is indicated at the onset of **inflammatory conditions**. Given early with aconite when fever only is present, the hyperæmia does not occur and the inflammation is aborted. If the disease is localized in any organ with the phenomena named above, its influence often is quickly apparent.

In **diphtheria, tonsillitis, croup, bronchitis, pneumonitis, pleuritis** and **peritonitis**, Belladonna stimulates the capillary circulation in the engorged organs, quickly preventing the local effects of the acute congestion or inflammation. At the same time it has a marked influence upon the fever in conjunction with the other indicated measures. In **chronic soreness** in the chest Belladonna is a valuable remedy. It is one of our best remedies in **whooping** cough. If half of a drop be given every two hours, alternated with a grain of alum in syrup, excellent results are often obtained.

In the therapeutics of all continued fevers this agent has an

essential place, in some stage of the fever. In fevers, of malarial origin, there is no other remedy that will replace it. In the sthenic stage of these fevers, combined with aconite it is sufficient for many of the indications. If there is an intermission or marked remission, it may be continued alone during this period.

In **typhoid fever** it is an important auxiliary almost during the entire duration of the fever. Contraindications may arise when it must be discontinued. It prevents congestion of the intestinal mucous membrane, and of the glands. This is indeed an important function. It stimulates the heart to diffuse the blood uniformly throughout the entire capillary circulation, and thus prevents cerebral engorgement. The brain symptoms exhibit many of the Belladonna indications and are quickly relieved by it. It may not convince the prescriber of its beneficial influence in only a single case, but its continued use in many cases is most convincing as compared with those in which it is not used.

In **meningeal inflammations** both of adults and children it is often sharply indicated. This is especially true in subacute cases in childhood, where there is slowly increasing dullness with a cold, moist skin, although there is an excess of two or three degrees of temperature. The pupils are dilated widely, the eyes are dull, the head is drawn back and crowded into the pillow, slowly and constantly rolled from side to side, the eyes are partly if not widely opened when the patient is asleep, and the urine passes involuntarily. These cases are sometimes exceedingly stubborn. Belladonna in frequent doses is the most directly indicated remedy.

Erysipelas will yield promptly to Belladonna in small doses. It is given with aconite or alternated with rhus. It should not be omitted. It acts most promptly if the tissues are smooth, dark, and deep red, with sluggish circulation and burning, the inflammation being confined to the structure of the integument and not in the areolar tissues, there being no pustulation, or vesicles present.

In **eruptive fevers** it is a most essential remedy. It quickly determines the eruption to the skin, and retrocession is almost impossible if it is used early. If retrocession has occurred it is the most prompt remedy known for restoration of the eruption.

In **scarlet fever** it has a salutary influence also upon the fever. It promotes exfoliation and assists in the general elimination of the products of the disease. It is directly opposed to the **renal hyperæmia** or the **nephritis** so common as a result of scarlet fever and diphtheria, and is our most reliable remedy to overcome this condition when it occurs. For the nephritis a drop of the tincture may be given to a child of ten years every two hours, alternated every hour with half a grain of *santonin*. If

there is a partial suppression of the urine and a large quantity of albumen present, two grains of gallic acid every two hours will facilitate a cure.

The agent given in small doses after exposure, and before the occurrence of scarlet fever, will act as prophylactic to the disease. The author has administered the remedy to the other exposed children, when a single case has appeared in a large family, none of whom had an attack. It must be given in small doses; five drops of specific Belladonna in four ounces of water, a teaspoonful every three hours, to a child of six years.

Belladonna is of value in **congestive neuralgias**. Full doses should be given. It will cure some exceedingly stubborn cases. It is an excellent plan to give it with ammonium chloride in stubborn, chronic cases.

In **prostrating night sweats**, with enfeebled circulation and cool relaxed skin, Belladonna or Atropine are advised. The 1/100 of a grain of Atropine at bedtime will accomplish excellent results. It may be given hypodermically. Medicinal doses of specific Belladonna during the day will accomplish similar results.

In **headache** from fullness of the circulation of the brain, dull frontal headache, with indisposition, malaise and cool skin, with mental torpor and a tendency to unpleasant dreams, this remedy is of value; half of a drop every hour or two.

The influence of this agent as an antispasmodic to involuntary muscular action, gives it some value in **spasmodic colic** and **obstinate constipation**. It is in common use in pills to facilitate the action of purgatives. In lead colic it is advised.

Belladonna in full physiological doses is an excellent remedy for the treatment of the conditions present during the passing of **biliary calculi**. It very materially facilitates the passage of the stone, prevents chronic change occurring in the structure of the duct, relaxes the duct by a paralyzing effect upon the circular muscular fibers and renders subsequent attacks less frequent and less severe.

Belladonna is of much service in the treatment of **nephritis**. Albuminaria is the result of greatly increased renal blood pressure and capillary engorgement. The agent antagonizes all the pathological processes in a direct manner. In acute cases its influence is apparent from the first. In subacute or chronic cases it must be persisted in, but the results are equally satisfactory where structural change has not taken place to too great a degree. Other indicated measures are not to be neglected. In **incontinence of urine**, where there is a plethoric tendency, stagnant capillary circulation or relaxed tissues, Belladonna is a prompt remedy. It is useful in **diabetes insipidus**, with cold extremities. In these cases it should be given in full doses.

By increasing the capillary circulation in the ovaries, this

agent is directly useful in **congestive dysmenorrhœa**. The direct indications for the agent are nearly always present in the cold skin, cold extremities, dullness, chilliness and inactivity. It may be given in drop doses preceding, during or subsequent to the period.

Its influence in stimulating the capillary circulation of the ovaries in stasis, renders it of value in the treatment of **sterility** from inactivity of those organs. It is exceedingly valuable in many of these cases. If there are hysterical manifestations at the menstrual epoch, with deficient menstruation, pulsatilla may be used in conjunction with it.

This agent will **retard** the **secretion of milk** in the lacteal glands, and is of much service when, from the death of the child or from acute inflammation, as in severe mastitis, where abscess is threatened, or from other causes, it is necessary to suppress the secretion. It may be given both internally and applied externally with good results. Its influence is wide and salutary. When restoration of the secretion is desired, it should be promptly discontinued.

Externally Belladonna is used in spinal tenderness with congestion, in congestive occipital headaches and lumbago. It is applied in all conditions inducing a lame back, and in neuralgia of the spinal and sacral nerves. In violent acute inflammation it acts as a sedative and anodyne, while it exercises its healing properties. It is used in rheumatism, in sprained and painful joints and in boils and carbuncles.

The extract of Belladonna is used in relaxing a rigid os uteri. An ointment is made and directly applied to the os. In this form it is of value in spasmodic urethral stricture, and in painful congestive conditions of the rectum. A prepared Belladonna plaster may be applied over inflamed organs, while the agent is being given internally.

HOMATROPINE HYDROBROMATE.

Formula— $C_{16}H_{21}NO_3HBr$.

Synonym—Hydrobromate of Homatropine.

Description—In the formation of Homatropine the chemical process consists of the decomposition of the amygdalate of tropine by hydrochloric acid. The Hydrobromate is a crystalline powder, or minute white crystals. Soluble in six parts of cold water, sparingly soluble in alcohol.

Therapy—The agent is not advised for internal administration, although in doses of $1/20$ of a grain it has been given for excessive night sweats. It is used in the **determination of refraction**, and in examination, in **ophthalmic practice**. Its advantage is in its promptness of action as a **midriatic** and its trans-

ient influence. It is used in the strength of four grains of the salt to an ounce of distilled water. It is in common use for complete paralysis. In this it is necessary to use a stronger solution—two per cent generally. A few drops instilled into the eye and repeated a few times, a few minutes apart, will in a short time accomplish the desired result. The pupil begins to dilate about ten minutes after it is first introduced. The effects are completely dissipated in the course of about thirty-six hours, while atropine retains its influence for, perhaps, ten days, and hyoscyamine for six or eight days.

The main objection to the use of Homatropine is the hyperæmia of the conjunctiva which follows its use. There is seldom, however, any acute inflammation. It does not so readily produce constitutional effects as atropine if absorbed.

In the treatment of inflammations it is not as serviceable as atropine. Because of the increased engorgement of blood in the part, it increases the condition. A further advantage of atropine over this agent in inflammations is its permanency or persistency of action.

STRAMONIUM.

DATURA STRAMONIUM.

Synonyms—Jamestown weed, Jimson weed.

Part Employed—Seed and leaves.

Natural Order—Solanaceæ.

Locality—Asia, and naturalized in North America, Europe and England.

Botanical Description—Stramonium was brought to this country by the ships of the Jamestown colony. It is an annual plant, flowering from June to September, with a coarse, rank scented, bushy, erect, succulent, green, nearly smooth stem, with several forked branches, three to five feet high, one to one and a half inches thick; leaves rise from the forks of the stem on long petioles, three to ten inches long, two to five inches wide, ovate, smooth, dark green above, paler beneath, unequal at base, coarsely incised, one side decurrent on the petiole, acuminate, thin, brittle; flowers large, erect, white on short petioles, funnel-shaped, five-petaled, five-plaited corolla, three to four inches long, two inches wide; calyx tubular, five-angled, five-toothed; stamens five; anthers oblong; style filiform; stigma thick, obtuse, bilobed; fruit capsule two inches long, obtusely quadrangular, ovate, half-four-celled, prickly, four-valved, dehiscing half way down into four segments; ovary two-carpelled, two-celled; seed reniform, one-sixth inch long, one-tenth inch broad, one-twenty-fifth inch thick, flattened, pitted, hilum in the sinus, brownish-black, hard, wrinkled; embryo curved, imbedded in white oily albumen, inodorous,

when bruised emits an unpleasant odor; taste oily, bitter. Solvent, dilute alcohol. Dose, from one to two grains.

CONSTITUENTS—Daturine, which, according to Ladenburg, is a mixture of atropine and hyoscyamine, stramonin, scopolamine.

PREPARATIONS—*Extractum Stramonii Seminis*, Extract of Stramonium Seed. Dose, grain one-sixth—one-half. *Unguentum Stramonii*, Stramonium Ointment. *Extractum Stramonii Seminis Fluidum*, Fluid Extract of Stramonium Seed. Dose, from one to five minims. *Specific Stramonium*. Dose, one-fourth to ten minims.

Physiological Action—The action of Stramonium on man is similar to that of belladonna. Moderate doses increase the frequency and fullness of the pulse, with dizziness and perspiration; a larger dose (five grains of the powdered leaves) causes nausea, thirst, dryness of the throat, difficulty of speech, dilatation of the pupils, fever, relaxation of the bowels and increase of urine; a poisonous dose causes delirium, with laughter, loquacity, violent striking and biting, with grotesque hallucinations. There is dizziness, with faintness, choreic agitation; face flushed and swollen, eyes bright, conjunctiva injected, pupils dilated, sight perverted—seeing objects black or green, skin red, with an eruption, as in scarlatina, followed by stupor and insensibility. There is primary stimulation of the vasomotor nerves, followed by paralysis. Daturine acts more powerfully than atropine, though their action is regarded as identical. The resemblance throughout the entire course of both the physiological and therapeutic action between Stramonium and belladonna is a very close one.

Stramonium is a narcotic poison, a stimulant to the nerve force in its direct effects, and profoundly so in its influence upon the sympathetic nervous system.

Therapy—In proper doses it acts as a sedative and anodyne in a manner similar to hyoscyamus. It is a remedy for **excitable mania** and **acute delirium**, with violent uncontrollable tendencies. It has been given in **epilepsy** for its soothing and tranquilizing effect, but its antispasmodic influence is not sufficiently great to place it among the agents for this disorder.

It has been given in **neuralgias** wherever located; in **neuralgic dysmenorrhœa**. In **hysterical mania**, accompanied with **convulsions**, epileptiform or other convulsions, it is an excellent remedy. In small doses it will remove the globus hystericus at any time.

It is credited with controlling the contractions and pain in approaching **miscarriage** and abortion, and preventing that accident.

In the treatment of that condition usually known as **milk sickness** in malarial localities, Kipley claims to cure all

cases with the freshly bruised seeds of *Stramonium*, giving as many as from fifteen to thirty seeds every two hours. To the animals who contract the disease, a teaspoonful of the seeds is given three or four times daily with satisfactory results.

He also gives it in the painful menstruation of women with good results, giving fifteen bruised seeds every few minutes until the pain is relieved, then farther apart.

As an ointment it has been long applied to inflamed swellings and to **glandular inflammations** and in painful **hemorrhoids**. It is useful in **mastitis**, **orchitis**, **parotitis**, in **rheumatic inflammations**, and as a fomentation in these latter conditions, and in **pleuritis** and **peritonitis**, using caution not to obtain too marked cerebral effects.

In **muscular tremblings** it is indicated, especially if of functional or reflex origin. In the vertigo and unsteadiness from chronic indigestion or disordered stomach from hyperacidity and in headache from this cause it is the remedy.

In spasmodic or paroxysmal **cough**, as whooping cough, and in the violent paroxysms of acute bronchial cough, it is a soothing remedy, as it acts without suppressing secretion as actively as belladonna.

Because of its antispasmodic influence upon **spasmodic asthma** it has come into general use as an agent in that disease. It has been long used as a domestic remedy for this condition. The dried leaves are burned and the fumes are inhaled and relief is immediate. The dried root in coarse powder as well as the powdered leaves may be smoked in a common tobacco pipe.

This use of the agent produces excessive expectoration, and also marked nervous phenomena, such as vertigo, nausea, determination of blood to the brain and stupor. In plethoric patients these induced symptoms are sometimes violent and even dangerous. It is sometimes burned in conjunction with potassium nitrate, to enhance its effects.

DUBOISIA.

DUBOISIA MYOPOROIDES.

Synonym—Corkwood Elm.

Part Used—The leaves.

Natural Order—Solanaceæ.

Locality—Australia.

Botanical Description—A small tree or glabrous shrub, leaves entire, alternate, oblong lanceolate, from two to four inches long, one inch wide, petiolate, midrib prominent; flowers of a pale lilac color or white, arranged in terminal panicles; berries nearly globular, taste bitter. Dose of leaves powdered, from one to three grains.

CONSTITUENTS—An alkaloid **Duboisine** similar to hyoscyamine and atropine. Dose, 1/130 to 1/50 grain, usually administered hypodermically.

PREPARATIONS—*Extractum Duboisiae*, Extract of Duboisia. Dose, 1/4 to 1/2 grain. *Extractum Duboisiae Fluidum*, Fluid Extract of Duboisia. From two to ten drops.

Physiological Action—Duboisia is similar in many respects in its influence, to stramonium, hyoscyamus and belladonna. It produces dryness in the mouth and constriction in the throat, with difficult deglutition. It increases the pulse rate and arterial tension, increases the capillary circulation in the skin, with flushed face like belladonna. The pupil dilates, there is a sensation of fullness in the head, with tinnitus aurium, vertigo, nervous excitement and muscular uncertainty. These conditions are followed by mental inactivity and stupor, with general quiet, although the patient may not sleep.

Therapy—The agent has not been extensively used for internal administration. It soothes the respiratory apparatus, increases the action of the heart, like belladonna in congestions, and is given to control excessive night sweats.

It has been given in some cases of **maniacal excitement**, but it must be given in the enfeebled cases and not when there is fullness—engorgement of the circulation of the cerebral organs. It has been used in the treatment of **emotional insanity** and **delirium** with excitement. Duboisine is given in doses of from 1/120 to the 1/60 of a grain in these cases, and is said to be a valuable hypnotic. In a few insane patients, especially those with hysterical manifestations, it has caused regurgitation of the food. It is also used in **muscular tremblings**, **paralysis agitans** and **epilepsy**.

There are a few patients who are especially susceptible to its use and will experience vertigo, fullness of the head, a feeling of danger and heart pains, even from small doses, or from a single drop of a one per cent solution in the eye.

Duboisia has been used as a **mydriatic**. It has no properties not possessed by atropine, although it is claimed to produce its effects in paralyzing accommodation and dilating the pupil more rapidly, with less conjunctival irritation and with more speedy recovery.

The hypodermic injection of Duboisine will antagonize the influence of opium or morphine as effectually as atropine.

PHYSOSTIGMA.**PHYSOSTIGMA VENENOSUM.**

Synonyms—Calabar bean, Ordeal bean, Chop nut.

Part Employed—The seed.

Locality—Africa, on the old Calabar and Niger rivers, Gulf of Guinea, Brazil.

Natural Order—Leguminosæ.

CONSTITUENTS—Physostigmine or Eserine, Calabarine, Eseridine, Phytosterin.

PREPARATIONS—Extractum Physostigmatis, Extract of Physostigma. Dose, from one-twentieth to one-eighth of a grain.

Tinctura Physostigmatis, Tincture of Physostigma. Dose, from three to ten minims.

Specific Physostigma. Dose, from one-fourth of a drop to five drops. Prescribed, from eight drops to two and one-half drams, in four ounces of water. A teaspoonful every two to four hours.

Physostigmine or Eserine—A crystalline solid white or pinkish colored, readily soluble in alcohol, sparingly soluble in water. Dose, $1/150$ to $1/30$ of a grain.

Physostigmine Sulphate—A crystalline powder, whitish or yellowish white, changing on exposure to a pink or reddish color, bitter, odorless, deliquescent; freely soluble in alcohol and water. Kept for preservation in amber-colored vials. Dose, $1/150$ to $1/30$ of a grain.

Solutions of one grain of Physostigmine or its sulphate to the ounce of distilled water is used in the eye, one drop three or four times daily.

Botanical Description, (J. U. Lloyd)—Physostigma venenosum is one of the numerous woody climbers which inhabit the tropical forests of Africa, sometimes reaching the length of fifty feet, with a stem two inches in diameter. The leaves are pinnately trifoliate and in size and shapes very closely approximate the leaves of the common "Lima bean." The poisonous seeds are closely related botanically to the ordinary edible beans (*phaseolus*) of our gardens. The structural difference mainly resides in the stigma.

The flowers are borne in pendulous racemes similar to the garden bean, but are of a darker color, the keel and wings being of a deep-purple color. The standard is folded and curved back; it is of lighter color than the wings. The wings and keel are almost concealed by the sheathing standard. The keel is spirally twisted at its apex, a character found only in a few genera (three) of the leguminosæ. The pistil has a stalked ovary, a slender style, curved with the keel and densely bearded on the inner side, and has a dilated triangular blade prolongation beyond the stigma which forms the generic distinction from the genus *phaseolus*. The fruit is a thick brown

pod containing each two or three large seeds which are familiar to us as Calabar beans."

Dr. W. F. Daniell, in 1846, stated that among the natives "persons suspected of a crime are forced to swallow a deadly poison made from the poisonous seeds of an aquatic leguminous plant which rapidly destroys life." The seed is called *esere* by the natives, which accounts for one of the alkaloids of Calabar being named *Eserine*. Less than half a bean is sufficient to destroy life if retained on the stomach; while, on the other hand, numbers of them may (exceptionally) be eaten without fatal effect to the person if they quickly produce vomiting and purging.

Physiological Action—The first influence of the agent upon internal administration in over doses is local—a sense of burning and irritation in the stomach, with nausea, vomiting and purging. The salivary, gastric and intestinal secretions are all greatly increased. It stimulates unstriated muscular fiber, producing in the intestinal canal increased peristalsis. There is inactivity, prostration, cold pallid skin and muscular incapacity.

The evidences of the action of this agent upon the nervous system are not marked. No pain is produced and the consciousness of the patient is usually retained. Probably, from deficient oxygenation of the blood, there is vertigo, which may finally induce narcosis. There are ultimate paralysis and temporary tetanic convulsions. There is abolition of motor reflex.

The arterial tension is at first lowered, then increased, the heart is slowed. There is a reduction in the number and force of the pulsations. The influence seems to be entirely upon the muscles of the heart, through overstimulation of the cardiac ganglia, and not through the central nervous system. The heart finally loses its contractility, is flabby, and fails in diastole. The respiration becomes slower, is shallow and feeble, and finally ceases. The heart continues to pulsate with increasing feebleness for some little time after respiration has ceased. The blood is loaded with carbonic acid gas, and the corpuscles are altered in their character.

The general muscular relaxation from this agent is most marked. Small, long continued doses induce feebleness and indisposition to muscular exertion. By full doses, tremors of the voluntary muscles are induced, and finally complete muscular paralysis. The muscular structure of the walls of the intestines is sometimes affected by tetanic spasm, followed by complete relaxation and paralysis.

The mind may continue clear. The influence, at first stimulant, is finally motor depressant, abolition of reflexes appears, with finally paralysis of the motor nerves, more slowly occurring.

It is quickly absorbed and readily eliminated through all the emunctories.

Upon the eye, when locally applied, this agent acts first by contracting the pupil. It afterward decreases intraocular tension, and produces spasm of accommodation and myopia. There is often pain of a severe contractile character produced in the eyeball.

Specific Symptomatology—The agent is useful where there is torpor, inactivity, atonicity of the intestinal canal, and of the organs of digestion and appropriation, or where from lack of nerve force there is deficient secretion, dryness of the mucous membranes, deficient glandular secretions with dry and hardened feces.

It increases the contractility of the muscles of the bladder walls, and of the uterus.

Although a motor depressant in large doses, in small medicinal doses it has a contrary influence.

Therapy—The agent may be given internally to allay the tension induced by extreme nervous irritation. Convulsive disorders from irritation are allayed by it, but it is not in general use for this purpose.

It has been used in **tetanus**, in **epilepsy** and in convulsions from all causes, also in **locomotor ataxia**, in **chorea** and in **progressive paralysis** of the insane. Its influence has not been such as to justify dependence upon it in these cases.

It stimulates the respiratory function and heart's action where there is great depression with **difficult breathing**, with a sense of compression or constriction of the chest, with soft, feeble pulse, cool, moist skin, and usually dilated pupils. It is the remedy for the dyspnœa under such circumstances. It is also advantageous where the **dyspnœa** is caused by a clogging up of the bronchi and air cells without power to expel the thick tenacious mucus. It will liquefy the secretion and increase the power to expel it.

In **emphysema** and in **asthma** with great muscular relaxation, in **bronchitis** with dilatation, it is useful. It restores tone in **phthisis** and overcomes **night sweats** of that disorder.

It may be of advantage in dilatation of the **stomach**, and in atony and extreme inactivity of the intestinal muscular structure. In **intestinal catarrh** from this cause it is of much service. It is also valuable in **catarrh** of the mucous linings of the **kidneys** and **bladder**, and in extreme atony, relaxation and plethora of the abdominal structures. It will assist in overcoming **chronic constipation** and a tendency to **flatulence** in atonic cases.

It is useful in tympanites and **flatulence** present during the **menopause**, where there is atonicity of the intestinal walls and **constipation**. In the condition known as **phantom tumor** it has been used advantageously.

Its chief influence is upon the eye. When **mydriasis** has been induced by atropine or other agent, a solution of the sulphate of Eserine will quickly restore the normal condition. Any **adhesions** of the **iris** which may have occurred as the result of inflammation may be broken up by this agent. It is used to reduce intraocular tension, as has been stated, and to increase the power of the muscles of accommodation, being valuable in paralysis of these muscles.

It is useful in **conjunctival inflammations** where **perforating ulcer** threatens to permit prolapse of the iris. It is especially advised when **ulceration** without determination of blood—indolent in character, nonvascularized—is present. It is useful in intermittent **strabismus**, in **glaucoma**, **asthenopia**, in **photophobia** and in some cases of neuralgia of the eyeball. After injury to the eyeball many conditions may occur which will be promptly relieved by the use of this agent.

Co-operatives—It may be combined with xanthoxylum, strychnia, nux vomica or capsicum with advantage. Belladonna will facilitate its action, also in its influence upon gastro-intestinal structures.

JEQUIRITY.

ABRUS PRECATORIUS.

Synonyms—Indian licorice, Jamaica wild licorice.

Part Employed—The seeds.

Natural Order—Leguminosæ.

PREPARATIONS—Jequirity seeds in ounce packages; also powdered, in ounce bottles. Fluid Jequirity, miscible with water; 100 parts represent twelve of the seed.

Administration—Dilute with three to five times its volume of pure water, and apply two drops once a day until the desired effect is produced. It is best to dilute only as it is required for use, as after dilution it quickly spoils. If the action is too severe, employ hot water freely, or very dilute solutions of corrosive sublimate, to control it.

A powerful poison when taken internally.

Therapy—Jequirity, when applied to the eye in the form of an infusion, produces a peculiar form of inflammation, attended with much pain and a copious muco-purulent discharge. By using weak solutions a moderate action may be induced, which can be easily held under control, and which has been found to be curative in cases of **pannus** and **trachoma** of long standing, also in chronic **conjunctivitis** and in purulent **ophthalmia**. It is violent in its action and must be used with care.

CHAPTER IV.

AMMONIA. AMMONIUM CARBONATE. AMMONIUM PHOSPHATE.
 AMYL NITRITE. NITROGLYCERINE.

AMMONIA.

Formula— NH_3 .

Occurrence—Produced by decomposition of organic matter containing nitrogen. It is given off in the decomposition of animal urine and in the burning of horn, hair or hides. It was first obtained from the distillation of camels' dung near the temple of Jupiter Ammon in the Libyan desert. It is now obtained as a by-product in the distillation of coal in the manufacture of illuminating gas.

Ammonia may also be produced by acting upon nitric acid with zinc, or it may be prepared by acting on muriate of ammonium—ammonium chloride, with quicklime.

Description—An intensely pungent, irrespirable gas, colorless and transparent, does not burn or support combustion. It is alkaline in its taste and in its reaction. It is half as heavy as the air, very soluble in water. At the freezing point one volume of water will dissolve 1150 volumes of Ammonia. Under pressure of only 6.5 atmospheres, it is reduced to a colorless, mobile, unstable liquid.

Anhydrous Ammonia—This liquid will solidify at -103° deg. Fah. It volatilizes rapidly with the abstraction of heat.

The compounds of ammonium are formed by the saturation of the ammonium radical (NH_4). In its compounds it acts similarly to sodium and potassium.

Aqua Ammonia.

Formula— $(\text{NH}_4) \text{HO}$.

Synonym—Ammonia water. Formed by the solution of the gas in water. It contains ten per cent, by weight, of the gas.

Aqua Ammonia Fortior—The stronger Ammonia B. P. contains twenty-eight per cent, by weight, of the gas. This preparation is too strong for medicinal use.

Aqua Ammonia is a transparent mobile liquid, colorless, with a pungent, stimulating odor and an acrid taste. It is positively alkaline in reaction. The gas is volatilized by heat, reducing the strength of the agent.

Physiological Action—In full strength Aqua Ammonia is caustic and irritant, applied to the skin. Internally it is a corrosive poison, producing gastro-enteritis. If inhaled in extreme quantity it produces mental confusion and cerebral congestion.

Therapy—It is used as a stimulant and antacid. It stimu-

lates the action of the heart and the respiration. It has long been in use as an antidote to the poison of venomous insects and reptiles. In extreme collapse, after severe injury, it has been injected diluted into the veins.

This is heroic treatment and is not commonly resorted to. The agent is in common domestic use for the treatment of syncope. If given internally, from five to fifteen minims, well diluted with water, is the dose.

Externally Ammonia serves an excellent purpose in many cases. Applied to the skin it produces speedy vesication. Closely confined the cuticle may be removed in a few minutes.

As a liniment it has long been used. One part of aqua Ammoniae combined with two parts of olive oil makes an excellent application to enlarged and indurated glands, swollen condition of the muscular tissues without inflammation, strained and sore muscles, and local soreness from any cause. It is probably one of the best applications to the swelled limb in phlegmasia alba dolens. It should be applied very freely, the limb swathed in cotton and a roller bandage applied over all.

Spirit of Ammonia.

Description—**Spirit of Ammonia**, formerly called ammoniated alcohol, is made by dissolving ten per cent of Ammonia gas in alcohol. It is a colorless liquid, with the odor and taste of Ammonia. Internally it is but little used, being replaced by the aromatic spirit. It has the alkaline properties of the Aqua Ammoniae, and its stimulating properties are enforced by those of the alcohol. Internally it may be given in doses of from five to twenty drops, fully diluted.

Aromatic Spirit of Ammonia.

Occurrence—The Aromatic Spirit of Ammonia is made by dissolving the carbonate of ammonium in water and adding a solution of Ammonia, volatile oil of nutmeg, oil of lemon and dilute alcohol, all in proper proportions.

The oils in this combination impart a pleasant odor and taste and give this form the advantage of greater palatability. It is more commonly used than the other liquid forms of Ammonia.

Therapy—It is prescribed wherever there is great weakness or prostration, with feeble action of the heart. It is immediate in its influence and reliable in its action. In **hysterical conditions** accompanied by nervous weakness and in general nervous debility it is in common use. It is of temporary benefit in **cerebral anæmia**, as it is an active stimulant to the capillary circulation of the brain. Internally it stimulates the action of the stomach, neutralizing hyperacidity, overcoming many

forms of **sick headache** and relieving gastric and intestinal flatulence. It is given in doses of from five to thirty minims.

Liquor Ammonii Acetatis,

Synonyms—Solution of Ammonium Acetate, Spirit of Min-
dererus.

Occurrence—Made by dissolving the carbonate of ammonium in dilute acetic acid and reducing the product with water. The official acid contains seven per cent of the acetate of ammonium.

Description—It is a colorless liquid of a salty taste, with a somewhat pungent odor and an acid reaction. It is unstable, carbonate of ammonium being generated by decomposition. It should always be prepared for immediate use.

Therapy—The agent has the characteristic stimulating effect of ammonium upon the system. If the skin be warm and the capillary vessels dilated, it acts as a diaphoretic, stimulating excretion through the cutaneous glands; but if the skin be cold and the capillaries are contracted, it acts profoundly upon the kidneys as a diuretic. In **eruptive fevers**, where there is imperfect circulation and the eruption fails to appear readily, it is sometimes an excellent remedy. Later, in these fevers, if there is depression of the nervous system, with inactivity of the skin and kidneys, it is valuable. Given in post-scarlatinal nephritis, with dropsy, it is sometimes most efficient. It acts in this condition in perfect harmony with belladonna, digitalis and santalin.

It is given in the convalescent stage of all **protracted** and exhausting **inflammatory diseases**, strengthening the action of the heart and increasing the tone and restoring the functional activity of all the organs of nutrition. It does not produce unpleasant head symptoms. It certainly sustains the powers of life in these cases and conduces to a more rapid recovery.

It has long been in common use among **alcoholics**. If a dram of it be given in a half glass of water it will sober an intoxicated person and produce a temporary steadiness of the nerves. The dose may be repeated every half hour if necessary until its effects are permanent in overcoming the debauch.

This agent is used in **la grippe**, in acute **laryngitis**, and in acute **pharyngitis**. It is especially valuable in acute **coryza**, and if given with aconite or other direct diaphoretics, it quickly overcomes the constitutional effects of a severe cold. It is of value in some cases of **rheumatism**, because of its stimulating influence on excretion.

In passive **menorrhagia** or in **metrorrhagia**, where there is debility with muscular relaxation and nervous weakness, it is a specific remedy. In **ovarian pain** from passive congestion, and

in uterine pains at the menstrual epoch, with the conditions above named, it is a useful remedy.

Externally it has long been employed as a discutient to indolent abscesses, glandular swellings, engorgements, and to dissipate incipient abscess in the mammary glands. The dose is from one to three fluid drams in sweetened water.

AMMONIUM CARBONATE.

Formula— $\text{NH}_4\text{HCO}_3, \text{NH}_4\text{NH}_2\text{CO}_2$.

Synonym—Carbonate of Ammonium.

Occurrence—Formed as the result of chemical reaction, taking place when the chloride or the sulphate of ammonium and the carbonate of calcium are sublimed together. The product is submitted to purification and resublimation.

Description—It forms in white transparent masses, but through the loss of ammonia and carbonic acid on exposure to the air, it becomes more opaque, and ultimately assumes the form of porous, friable lumps, or is reduced to a fine white powder devoid of value. It is an intensely pungent volatile, ammoniacal salt, with a sharp, biting, salty taste and the characteristic odor. The entire salt will finally evaporate. It is freely soluble in hot water and in five parts of cold water, and gives off both its carbonic and ammoniacal gases in hot water.

Administration—It is objectionable to the taste and care should be taken to render it palatable by elixirs and flavored syrups. The dose is from two to twelve grains in a proper menstruum.

Therapy—This agent is a quick and sure stimulant for sudden and extreme depression. It arouses the heart's action promptly and supports it in threatened **collapse**. It is common practice to combine ten or fifteen grains with as many minims of the tincture of digitalis when there is **surgical shock**, or severe intestinal **hemorrhage** in **typhoid**, and repeat the dose, or give a smaller one, as soon as the effect of the first one is dissipated, until the reaction occurs. It restores from syncope. It is used in the collapse of **profound anæsthesia**, to overcome the depression of the heart and respiratory functions.

Its alkaline reaction renders it valuable as an antacid, and an excess of gastric acidity should determine its selection for more prolonged use. It is a superb stimulant in cases of greatly **diminished vitality** after prolonged illness, or in chronic disease, where there is hyperacidity of the gastric and intestinal secretions. It is valuable in **hysteria** with acid eructations and frequent sick headache, with a thick tongue, the papillæ of which are greatly elongated and tipped with a whitish coat, and the mucous membranes of a pale color. In

nervous, feeble women without ambition, constantly irritated with inactivity of the vital functions, this stimulant is prompt and reliable.

It is not as useful in **epilepsy** as the bromide of ammonium, nor as a sedative in feeble nervous conditions, as the valerianate of ammonium, but it is indicated when greater force, greater stimulation and increased power are demanded. It is more of a stimulant than a sedative, and is especially effective in **asthenia**.

This agent is one of the most common of the **stimulating expectorants**. It is a restorative to enfeebled conditions of the bronchial membranes when there is an excessive outpour of mucus, which seems to enfeeble the patient, and is therefore indicated in chronic **bronchitis** and in **bronchorrhœa**. In small frequent doses it is useful in the later stages of bronchitis, and in **pneumonia** in children it supports the vital powers and restores normal function. If there is obstructed breathing, with deficient oxidation and feeble heart action, it is a useful remedy.

This agent acts in many cases upon the skin. In febrile conditions, with feebleness, it is a very excellent diaphoretic. Dr. Peart, of England, used the Carbonate of Ammonium in three hundred cases of **scarlet fever**, and claimed success in every case. It is given in small doses every hour, reducing the fever and delirium, inducing sleep and stimulating the action of the skin and kidneys. It develops the rash in all cases, and where there is a retrocession of the eruption it will quickly restore it to the surface. Minger speaks most highly of this remedy in scarlet fever, **measles** and in **erysipelas**. If this agent is depended upon, chemical incompatibles, as acids, must be avoided. The agent is best given with milk when much of its unpleasant taste is obscured.

The Carbonate of Ammonium is used to counteract the effects of many poisons which have a depressing action on the system, such as veratrum, gelsemium, aconite, digitalis, hydrocyanic acid and others.

AMMONIUM PHOSPHATE.

Formula— $(\text{NH}_4)_2 \text{HPO}_4$.

Synonym—Phosphate of Ammonium.

Description—Made by dissolving gaseous ammonia in dilute phosphoric acid. It occurs in colorless translucent crystals, is unstable, odorless, with a characteristic salty taste. It dissolves freely in hot water, in four parts of cold water, and in alcohol.

Administration—The dose is from five to thirty grains dissolved in water and administered every three or four hours.

Therapy—It is or would be indicated in those cases where, with general nervous prostration, there is **feebleness** of the **heart's action**, and in fact feebleness of all of the vital functions due to deficient nerve power. It should be used in these cases with expectation of perfect results, as it is a stimulant restorative to the nervous system. It promotes elimination, and has been used freely in **gout** and **chronic rheumatism** in enfeebled patients.

AMYL NITRITE.

Formula— $C_5H_{11}NO_2$.

Synonym—Nitrite of Amyl.

Occurrence—Produced by the action of nitric or nitrous acid on amyl alcohol, the oxide of the amyl radical, the fifth in the Methane series of organic compounds. The chemical process is a complex one.

Description—The product is a pale, clear, yellowish liquid with a characteristic fruity, ethereal odor, and a pungent, aromatic taste. It is insoluble in water, mixes in all proportions with alcohol or ether, is volatile at all temperatures and readily inflammable.

Administration—In its administration, glass pearls containing about three minims of this agent are crushed in a handkerchief and the fumes inhaled. This method prevents over-administration.

The agent should usually be administered with the patient in a recumbent position, because of its immediate and profound impression upon the circulation.

In reducing the dose of this remedy the best plan will be to dissolve five minims in one dram of dilute alcohol. Of this one minim will equal $\frac{1}{12}$ of a minim of the nitrite. It can be given then as indicated.

Physiological Action—Because of the extreme volatile character of the agent, its influence upon the system is prompt and violent in proportion to the amount used.

It produces headache, confusion of ideas, vertigo, and relaxation of both voluntary and involuntary muscles. There is dilatation of the retinal vessels with hyperæmia.

It is exceeded in its promptness of action upon the nervous system by hydrocyanic acid alone. It affects the motor side of the spinal cord. Its ingestion induces staggering, loss of co-ordination, flushed face, fullness of the head, roaring in the ears and general muscular relaxation. The heart's action is increased in force and rapidity. There is great dilatation of the arteries by temporary paralysis of the sympathetic. The heart finally becomes weak and the blood assumes a dark hue. The respira-

tion is at first rapid, but increased doses produce slow and labored breathing from depression of the respiratory nerve. The heat of the body is reduced.

In poisonous doses the pulse gradually becomes slower, the heart is greatly weakened, the respiration is slow and shallow, the temperature is sub-normal, the extremities cold, there is great muscular weakness, cyanosis, extreme vertigo, disordered vision and death from failure of heart and respiratory action.

Used for its therapeutic effects the agent is administered by inhalation. A single breath of the vapor of three drops will produce a flushed face and dizziness, throbbing of the carotid arteries, with sensation of fullness in the head and quick pulse.

Therapy—It is a profound restorative in extreme conditions. It was first used to overcome **chloroform asphyxia**, and is exceedingly efficacious where the influence of chloroform has produced profound cerebral anæmia.

It is a popular remedy in the treatment of **angina pectoris**. If the attack is accompanied by high arterial tension, the relaxing influence of this agent will give immediate relief.

Because of its influence in relaxing the muscular system it is used in general and local muscular spasms. It is useful in **epilepsy** to overcome the spasm, and when there is an *aura* its inhalation will abort the attack. It is used in **tetanus** and in the convulsions of strychnine poisoning with excellent results, but it must be given, if possible, preceding the spasm, as the respiration is usually interfered with. It will relax the spasm in puerperal eclampsia, but at the same time it produces relaxation of the unstriated muscular fiber of the womb and permits post-partum hemorrhage.

It is too active for use in the convulsions of childhood, although it is sometimes so advised. It is used in spasmodic **asthma**, in **whooping cough** and in **laryngismus stridulus**, but should not be administered to young children.

This has been advised for occasional administration in **chronic nephritis**, with high arterial tension, and also in cases of extreme cerebral anæmia. In both cases, however, it is replaced to an excellent advantage by nitroglycerine.

It has proved to be of much value in that condition so much complained of by ladies at the **menopause**, or during the child-bearing period, when the menses have been interrupted in their regularity, and at other times with all patients when there are **flashes of heat**, local burnings of the skin, flushed face or burning hands; where the venous capillaries are engorged in certain localities, and are more or less empty in others—an irregularity of distribution of the blood in the capillary circulation. These irregular flushings have been satisfactorily corrected by the internal use of one drop of the Nitrite of Amyl three or four times daily. If the patient is sensitive to the action of the

remedy a small dose may be given. One, two or three minims may be inhaled.

Antidotes—In the treatment of poisoning by this agent, profound diffusible stimulants are necessary, and perhaps artificial respiration, with strychnine, strophanthus or digitalis, hypodermically, is essential to sustain the heart, and cold should be applied to the head.

NITROGLYCERINE.

Formula— $C_3H_5(NO_3)_3$.

Synonyms—Glonoin, Trinitrine.

Description—A bright yellow liquid with extreme explosive properties produced by adding glycerine in small portions to a mixture of four parts of concentrated sulphuric acid and one part of strong nitric acid.

It was discovered by Sobrero in 1847, and has been since generally used for explosive purposes. It has a specific gravity of 1.06. It has a sweet, aromatic, pungent taste, without odor and slightly soluble in water, but readily soluble in alcohol and ether.

Administration—The alcoholic solution, the **Spirit of Glonoin** or **Spirit of Nitroglycerine**, is the preparation used in medicine. It is formed by combining one part of Nitroglycerine with ninety-nine parts of the rectified spirits of wine. It is a clear, colorless liquid with the odor and taste of alcohol. It must be handled and tasted with extreme care.

The dose is one or two drops, of the above one per cent solution, graduated according to its rapidity of action. A single overdose will induce a fullness of the head with a feeling of pressure and pain.

Physiological Action—Two drops upon the tongue often produces immediate acute cerebral engorgement, with flushed face and violent headache. The use of this agent as a powerful **brain stimulant** and to induce **cerebral hyperæmia**, is becoming more and more general. Its effects are immediate and more or less violent. It stimulates the heart's action and induces nausea. It induces other phenomena similar to those of the amyl nitrite.

Therapy—In sudden or acute **cerebral anæmia** from any cause, especially that induced by **sunstroke**, it will act in a manner superior to any other agent. It has controlled many cases of **post-partum hemorrhage** by determining the blood to the nerve centers and increasing nerve control.

It has acted nicely in **angina pectoris** and in **cardiac neuralgia**. In anæmic headache it is a specific remedy. It may be continued for some days if necessary, in doses of one minim of the one

per cent solution, every two or three hours. In exhaustion following prostrating fevers it has been used favorably in a few cases.

Its hypodermic use is resorted to in patients **asphyxiated** by **drowning** or by the inhalation of **illuminating gas**. In opium poisoning with uræmic symptoms, it has acted promptly and decisively, as it acts in all cases. Its effects should be well studied. Small doses frequently repeated will not disappoint the prescriber when given in the lines of its specific action as described above.

In **angina pectoris**, and in **asthma**, especially **spasmodic asthma**, its administration has produced excellent results. It is coming into very general use in the treatment of the latter condition. In **palpitation** with pallor it works well. Given in advance of the attack it has warded off **epilepsy** and has caused general relaxation in **tetanus**. In vomiting of a reflex character, in seasickness, and in renal and hepatic colic, it has cured many cases. It is a remedy for internal use in **anæmia** with **chronic heart disease**. In the **anæmic headaches** common under these circumstances, and in fact in all headaches of an anæmic character, it is a most prompt agent for the relief of pain and distress. It supersedes many other agents in the promptness of its action.

In the treatment of **albuminuria**—either acute or chronic Bright's disease, much benefit is claimed from it by various writers. It must be administered in small doses and persisted in. It reduces the arterial tension which results in degenerative changes in the renal organs, and in the renal ganglia. Its physiological action would suggest it as a direct remedy. Bartholow claims that if given preceding the chill in intermittents, or in pernicious malarial disease, it will act as an anti-periodic, warding off the attack and preventing the depressing effects of the cold stage.

GROUP II.

Agents Acting upon the Heart.

CHAPTER I.

CACTUS.
DIGITALIS.

STROPHANTHUS.
CONVALLARIA.

LYCOPUS.
ADONIS.

CACTUS.

CACTUS GRANDIFLORUS.

Synonyms—*Cereus Grandiflorus* (Haworth); Night-Blooming *Cereus*; *Cactus Grandiflorus* (Lin.).

Part Employed—Stems and flowers.

Natural Order—Cactæ.

Location—West India Islands and Mexico.

PREPARATIONS—*Extractum Cacti Fluidum*, Fluid Extract of Cactus. Dose, from one to twenty minims.

Tinctura Cacti, Tincture of Cactus. Dose, from five to thirty minims.

Specific *Cactus Grandiflorus* is prepared from the green stem of the true species. The dose is from one-third of a minim to two minims. This is a reliable preparation. Although the medicinal effects may be obtained from two minims, larger doses may be given, no toxic effects having been observed.

Botanical Description—A green stem, branching, fleshy, with the characteristic angles of the species, five or six in number; an equal number of short radiating spines. Imbricated calyx lobes, acute, linear. Its stems, radicans, diffuse, angular; areolar, spinulose; spines short, nearly equaling the wool in length. Large, white, nocturnal flowers, pleasantly and strongly fragrant, which begin to open between seven and eight o'clock in the evening and are fully blown by eleven, continuing in full bloom about six hours. In the early morning they fade, but during their short existence there is hardly any flower of greater beauty, or that makes a more attractive display. The calyx of the flower, when open, is about six to eight inches in diameter; the inside being of a splendid yellow color, appears like the rays of a bright star; the outside is dark brown.

The petals are of a pure white, and contribute greatly to the luster; the vast numbers of recurved stamens in the center of the flower make a fine appearance.

Physiological Action—This remedy increases the musculo-motor energy of the heart, elevates arterial tension, in-

creasing the height and force of the pulse wave. This is accomplished by increased heart action, stimulation of the vaso-motor center, and stimulation of the spinal-motor centers, increasing their activity and improving the general nerve tone. It is the heart tonic *par excellence*, as it produces stimulation from actually increased nerve tone, through improved nutrition of the entire nervous and muscular structure of the heart. It produces no irritation of the heart muscles like *strophanthus*, or gastric irritation or cumulation like *digitalis*.

Cactus exercises a direct influence over the sympathetic nervous system, regulating its action, restoring normal action, whatever the perversion. It acts directly upon the cardiac plexus, regulating the functional activity of the heart.

Investigations have proven that it increases the contractile power and energy of the heart muscle, through the intercardiac ganglia and accelerator nerves. It certainly improves the nutrition of the heart, as we have noticed the entire removal of progressive valvular murmurs after its continued use.

Specific Symptomatology—An irregular pulse, feebleness of the heart's action, dyspnoea, weight, oppression in the chest, violence of the heart's action depending upon atonicity or enervation, and a sensation of a constriction or band around the heart or around the chest, are the direct indications for its use in heart troubles.

Therapy—This agent is prescribed where the **heart muscle** is **enfeebled**, where there is **progressive valvular inefficiency**, with irregular or intermittent pulse. It is valuable in **mitral** or **aortic regurgitation** from whatever cause.

It is an exceedingly useful agent in **functional irregularity** of the heart, however evidenced, if due to gastric irritation, as the agent in doses of from one to three minims, soothes gastric irritability and imparts tone and improved function, in wide contrast to *digitalis*, which irritates the stomach.

Those who have used all of the heart remedies unite in the belief that for breadth of action, for specific directness, for reliability and smoothness and general trustworthiness, *Cactus* takes preference over all the rest. Its influence is admirable where indicated and it is invaluable in many cases. Other remedies in some cases will do as much in single lines, but none will do more, and none will exercise all of its desirable influences.

The writer has given it in valvular troubles, in weak and irregular conditions, depending upon muscular enervation, and in aortic regurgitation, and has seen cures accomplished that had been thought impossible. It permanently strengthens the muscular action of the heart.

The author's experience with this remedy caused him to come to the conclusion a few years ago that *Cactus* had

a **special sedative** influence where indicated. He was convinced of the fact ultimately and now finds excellent authority for his conclusion. Rubini, of Naples, claims that it is almost the counterpart of aconite in its action, differing in that it increases the strength and tone of the nerve centers instead of paralyzing them, as large doses of the latter agent does. Given, a condition in which there is a rapid and feeble pulse, weak heart, weak and exhausted nervous system, Cactus in small doses, frequently repeated, is a true sedative.

Cactus may be said to be a true nerve tonic and restorative. It improves the nutrition of the brain by improving the circulation in that organ. In this it is of advantage in some cases of **neurasthenia**, especially in those in which there is a sensation of a band or cord around the body or chest or head, a symptom often spoken of in nervous exhaustion, and in forms of **paralysis**. Where feebleness is the cause of **nervous excitement**, Cactus exercises a nerve sedative influence. In oppressive **headache** in the top of the head, causing nervousness, common to ladies at the menopause, resulting from irritation in the pelvic organs, or congestion, or menorrhagia with excessive losses of blood, it is of benefit.

Where there is increased arterial tension, and exaltation of nerve force and excess of strength in the cardiac action, Cactus is contraindicated. This is true in prescribing it for heart disease and palpitation. We have had several cases of palpitation, depending on exaltation of nerve energy, increased by Cactus, and decreased by gelsemium, cimicifuga or the bromides.

It may be given with excellent results combined with *avena sativa* in **impotence** accompanied with general nervous exhaustion, or in combination with *avena sativa* and *saw palmetto* in the feebleness and impotency of approaching age, or in the prostration following habits of dissipation, when it will accomplish most excellent results.

It is given in **endocarditis** and in **pericarditis** following exhausting diseases as sequelæ, with the most gratifying results.

In a marked case of endocarditis following measles, with purple and bloated countenance, distressing dyspnœa, and a pulse so rapid, feeble and fluttering that it could not be counted, the dyspnœa was overcome, the heart beats reduced to 120, and regular, and every condition improved in the most satisfactory manner in twenty-four hours, incredible as it may seem, by the use of one drop of the fluid extract of Cactus every hour.

In valvular incompetency due to muscular weakness, in the feeble heart action following **pneumonia**, **typhoid** and other severe and prostrating diseases, and in the functional heart disorder, and even organic weakness, following the **use of cigarettes** in boys, and that following **masturbation** and the use of alcohol, and the overstrained **bicycle heart**, there is no remedy

which will supersede it in efficient action. In the feeble heart of exophthalmic **goitre**, it will do all that is expected of strophanthus.

DIGITALIS.

Synonym—Foxglove.

Part Employed—The full grown leaves, collected in the second year of the plant's growth.

Natural Order—Scrophulariaceæ.

Locality—Europe.

Botanical Description—A biennial plant, growing from two to five feet high; stem straight, wandlike; a single, erect, downy flower; stalk terminating in a spike of beautiful purple flowers. The leaves are from six to eight inches long, two to three inches wide, on short winged foot-stalks, contracted at base into a petiole, downy, dull green, crenate. The upper leaves are alternate, sparse, lanceolate.

The dried leaf has a faint tea-like odor with a bitter, nauseous taste. The flower is somewhat elongated, tubular, bell-shaped, purple outside, whitish inside, sprinkled with black spots, inside the mouth hairy, with terminal racemes. It flowers in July and August. Flowers arranged in one-sided, simple, terminal racemes; calyx five-pointed; stamens inserted into the base of the corolla; anthers large; style simple; stigma consisting of small, numerous, grayish brown seeds, in a two-celled pyramidal capsule. Dose of the powdered leaves, one to two grains.

The leaves should be collected during the period of efflorescence from plants of the second year's growth, and only perfect leaves should be gathered. They should be carefully dried and preserved in air-tight tin canisters.

CONSTITUENTS—Digitalin, digitoxin, digitonin, digitalacrin, a stearopten digitalosmin and digitaloic acid.

PREPARATIONS—Extractum Digitalis Fluidum, Fluid Extract of Digitalis. Dose, from one to three minims.

Tinctura Digitalis, Tincture of Digitalis. Dose, from five to twenty minims.

Infusum Digitalis, Infusion of Digitalis. Dose, from one dram to one-half ounce.

Specific Digitalis. Dose, from one-sixth to three minims. Prescribed, from five minims to one and one-half drams in four ounces of water, a teaspoonful every hour or two.

Physiological Action—Digitalis in full doses produces a great rise in arterial pressure, followed by a marked fall. It acts on the inhibitory nerves and on the heart muscle; the increased action being due to vasomotor spasm and to stimulation of the

DIGITALIS PURPUREA.

heart itself. A poisonous dose causes depression and a dicrotic pulse, while the immediate effect of moderate doses is to stimulate the heart. Its prolonged use weakens the heart muscle by decreasing its normal nutrition.

When given in frequent small doses, where absorption is immediate, it influences all of the organic functions as a depressant; it produces irritation of the stomach and bowels, increased action of the kidneys, and a marked change in the character, regularity and frequency of the pulse beat. The influence upon the heart is not always uniform in all such cases, but variable and often unreliable. The influence is marked and more immediate if a large dose is given and repeated a few times. The gastric and intestinal irritation is greatly increased, there is purging, violent vomiting, great prostration with dicrotic or tumultuous, irregular, erratic and uncertain heart action.

In its general irritating influence upon organic function it may cause so marked an impression upon the renal circulation as to result in spasm of the vessel walls and suspension of renal action—suppression of urine with profound albuminuria.

Therapy—Digitalis is the direct heart stimulant. Its influence is sure and plainly apparent in marked sthenic conditions. In **prostration** or profound weakness, in sudden failure from violent injury, from **surgical shock**, or from **acute poisoning**, or in the crisis of extreme exhausting or protracted disease, its influence given in conjunction with general stimulants is decisive and satisfactory.

The agent sustains the action of the heart, but does not impart tone as cactus does, by increased nerve force and improved nutrition of the organ. Its sustaining power can be maintained by proper administration until other measures supply deficient power, by encouraging reaction, or by general improved nutrition.

The influence of Digitalis in its stimulant effect is nearly diametrically opposed to that of aconite. In therapeutic action the two agents occupy the opposite extremes. For this reason Digitalis, within the limits of its stimulant action, is a physiological antidote to aconite.

Digitalis slows a rapid and feeble pulse in **sthenic fever**.

It is a sedative in fevers under those circumstances in which aconite is contraindicated. In prolonged cases where sthenic conditions prevail, and where the temperature remains high, with rapid, feeble, easily compressed pulse or irregular heart action, all the evidences of failure of vital force, Digitalis is the fever remedy. It controls the pulse, reduces the temperature somewhat and improves the heart action. Aconite, veratrum and the synthetic antipyretics will all increase the condition under such circumstances and are contraindicated.

In **pneumonia**, when the disease processes have had full

sway, and the heart is unable to properly fill the pulmonary capillaries, and is depressed by the influence of the general disorder, and the general effects of the accumulated carbonic acid within the blood, and is labored and overtaxed and apparently slowly failing, this agent is directly useful. It promptly strengthens the heart and the nervous structure of the pulmonary apparatus at the same time.

In minute doses in children, if it be given with belladonna or other heart stimulants, it shows a most desirable influence in this class of cases, but should be stopped as soon as these results are obtained, that no untoward symptoms may occur.

Digitalis is a remedy for **passive congestion** where the blood stasis has occurred from feebleness and failure of the circulatory organs. It exercises a stimulating influence upon the entire apparatus; through its power of increasing heart action it imparts renewed force and an improved capillary tonus in every part. In such cases its influence resembles that of belladonna, although not so marked nor permanent.

In **valvular diseases** of the heart, with muscular relaxation and feebleness, it is a good remedy, but not always the best. It sustains the power for a time in those cases where there is **stenosis**, and where compensatory dilatation has previously occurred. In feeble, irregular and **intermittent heart** it is frequently prescribed with excellent results.

Like cactus, it is not a remedy for violent heart action from overaction of the nervous system, or from asthenic conditions.

Cactus is valuable, indeed, in irritable heart from indigestion; in palpitation and irregular action from gastric irritation, while in this case Digitalis exercises no beneficial influences whatever. On the contrary, it is apt to increase the gastric irritation. Cactus soothes the irritable stomach and promotes normal functional operations.

Digitalis is not found in the urine and does not directly influence the secretory or the excretory functions of the kidneys. Its apparent influence upon these organs is due to the improved blood pressure from its direct influence upon the heart, inducing increased heart action. **Renal congestion** is overcome because the increased heart impulse drives the blood through the renal capillaries with renewed vigor, and there is thus a copious flow of the urine from improved renal circulation. Under these circumstances only, is it a valuable remedy in dropsy. In **cardiac dropsy** it acts most promptly if given in infusion in small and frequently repeated doses. Close watch must be kept for cumulative action. In dropsy from **post-scarlatinal nephritis**, a dram or two of the leaves in a pint of water is thoroughly steeped. Of this from a teaspoonful to a tablespoonful may be given every two or three hours.

In general dropsy from heart disease there is deficient cap-

illary circulation, especially when lying down; the pulse is irregular, intermittent and feeble, the urine is small in quantity, with a large percentage of albumen. Its power over the heart influences this entire train of symptoms directly. Patients taking Digitalis in full doses for an immediate effect should remain in the recumbent position. This position greatly favors its sedative and tonic action, and patients have died upon being raised to a sitting posture immediately after having taken an extreme dose of this agent. Syncope, especially in children, is common at such a time. The profound influence of the remedy prevents the occurrence of the natural change in the action of the heart, from a prone position to the sitting posture. Digitalis may exercise no apparent influence upon the system when proper doses are given regularly for some days, until suddenly violent poisonous effects may appear, with irregular and greatly depressed heart action, vertigo, extreme wakefulness, vomiting, irritation of the bowels, with pain and sometimes violent purging.

The cause or manner of its accumulation is variously explained and is not well understood. Several theories are advanced, none of which are satisfactory. No other heart remedy has these objections. Cumulative action often shows itself first by the influence of the agent upon the kidneys, in suspending or restraining their action. Consequently if desirable results from the use of this agent do not appear, and there is a decrease in the quantity of urine passed, the agent should be suspended, at least for a time.

STROPHANTHUS.

STROPHANTHUS HISPIDUS.

Part Employed—The mature seed freed from the awns.

Natural Order—Apocynaceæ.

Location—Southeastern Tropical Africa and Southern Asia.

CONSTITUENTS—**Strophanthin**. The active principle of the plant, a glucoside, a white crystalline powder, neutral, bitter, insoluble in water, insoluble in ether and chloroform. Dose, 1/600 to 1/200 of a grain.

Strophanthidin and kombic acid.

PREPARATIONS—Tincture *Strophanthus* is prepared from the seeds alone. Dose, 1 to 10 minims administered cautiously.

Specific *Strophanthus* is made from the seeds, is of full strength, and should be given in smaller doses than the official tincture. The dose is from one-half to five minims.

Granules of Strophanthin containing 1/500 of a grain are prepared and may be given, two or three granules every half-hour in extreme cases, until the force and power of the heart are improved, then every two hours.

In administering the alcoholic tinctures of *Strophanthus* it

should not be prescribed in an aqueous or syrupy menstruum, as the agent precipitates in aqueous solution. It should be dropped from the bottle into the menstruum at the moment of administration.

Botanical Description—A woody climber of the African forests. It climbs the highest trees and hangs in festoons from tree to tree and lies in coils upon the ground. The stem is several inches thick in some cases. It flowers in October and in November. The original description of Prof. Oliver was as follows: "It has dense rough branches, leaves shortly petiolate, broadly elliptical with obtuse apices (in young state rough and hairy on the upper surface, tomentose below), inflorescence in hairy cymes with few flowers, with linear lanceolate caducous bracts, the linear acuminate lobes of the calyx being shorter than the tube of the corolla. Leaves 2 $\frac{1}{2}$ to 3 $\frac{1}{2}$ inches long, 2 to 2 $\frac{1}{2}$ inches broad, coarsely scabrid—hirsute above, thickly clothed beneath with a paler coarse tomentum. Pedicels hirsute, equaling or shorter than the calyx. Calyx-lobes $\frac{1}{2}$ to $\frac{2}{3}$ inches long, $\frac{1}{12}$ to $\frac{1}{8}$ inch broad. Corolla puberulent, or subhirsute below externally; lobes elongate, brittle when dry, probably two inches long, or longer; ovary bifid, densely hirsute."

Physiological Action—*Strophanthus* is the Kombe arrow poison, acting vigorously upon all muscular structure and specifically, upon the muscular structure of the heart. In some cases it affects the respiratory muscles so profoundly as to produce respiratory paralysis and death.

The combined results of various experiments made on the action of *Strophanthus* do not confirm the opinion that its specific influence is exerted upon the heart through its influence upon the nerve centers. Its influence, consequently, is more restricted, although equally valuable with other heart agents within the field of its influence. The conclusions of Delsaux, of Brussels, are that:

Strophanthus, in small doses, renders the pulse stronger and less frequent; arterial tension is increased. In toxic doses the systolic contractions become very frequent and very brief, followed, consequently, by enormous increase of blood pressure, to which is added sudden cessation of the heart in diastole. Respiration ceases last.

It exercises an irritating influence directly on the muscle fibers of the heart. Its action on the heart is the same as that of muscarine. It does not act on the vaso-constrictors.

Under physiological conditions, the diuretic action is uncertain. Under pathological conditions, it renders the pulse less frequent, more vigorous and more regular; it promotes diuresis, causes the disappearance of dropsical swellings, and improves the subjective condition of the patient.

Unlike the most of the heart remedies, the effects of Strophanthus seem to be caused by the agent being brought into direct contact with the muscular structure of the heart itself, after absorption into the blood. There is excellent authority for the belief that it neither acts through the medulla nor through the inherent ganglionic heart centers. It acts by contact. It causes violent contraction of the heart muscle in extreme cases, being the only one of the heart poisons to leave the heart in systole after death from its use. It does not influence the vascular system.

The **diuretic influence** of the agent, if observed, is quite permanent. It increases the blood pressure in the kidneys to a great degree through its influence on the heart muscles, and thus directly upon the capillary circulation. It is also direct in its action upon the secreting and excreting mechanism of the kidney; by this influence its diuretic action is explained.

Specific Symptomatology—The direct indications for this agent are a weak and rapid heart from muscular weakness, inactivity or lack of contractile power. Apparently Strophanthus acts similarly to digitalis, but it is not a cumulative poison. Pius, of Vienna, says in **disturbances of compensation**, Strophanthus acts well. The pulse becomes stronger and diminished in frequency, respiration becomes normal and dyspnoea less marked.

Therapy—In **rapid and feeble heart** Strophanthus reduces the pulse and increases the power. In some cases it also reduces the temperature. Whenever used its effects are observed in a remarkably short time.

Dyspnoea is relieved in a few minutes after its administration, and the pulse becomes stronger and more regular in less than an hour. Its influence is exceedingly persistent and can be depended upon sometimes for weeks after the agent is discontinued.

In **asthma** the paroxysm is shortened and prevented, diuresis begins, and oedema disappears, not to reappear save in exceptional cases. In every way the patient experiences relief.

It has been employed in **fatty degeneration** of the heart, in acute **endocarditis**, in **atheroma** of the arteries, in chronic **Bright's disease**, in **ascites** produced by cirrhosis of the liver, and certain pelvic tumors, in the enfeebled heart after acute and chronic fevers, in acceleration of the pulse, and **reflex palpitation** of neurasthenia, hysteria and chlorosis.

Strophanthus is contraindicated in ascites of tumors, hepatic, splenic and pelvic, in respiratory and circulatory troubles of vasomotor origin, in active hyperæmia, and in cases in which there is a tendency to visceral hemorrhages.

In its influence upon the stomach it improves the digestion and increases the appetite. Like other heart tonics it may induce gastric irritation if given too long or too frequently, but this effect rarely occurs. It does not increase nerve tone.

In the Indian Medical Gazette, Dr. Sanders reported seventeen cases of **cholera** treated with tincture of *Strophanthus*, all successfully. The results were quick recovery from collapse and a gradual rise of temperature.

Vacci claimed that in cases of **persistent anæmia** of a chronic character, in acute anæmia from flooding, especially where the heart's action is feeble and imperfect, he has found *Strophanthus* to materially assist the **appropriation of iron**. In some cases where iron had been given a long time, causing insomnia, general nervousness and palpitation with indigestion, where it seemed necessary to stop the iron entirely, he has used Blaud's pill with tincture of *Strophanthus* with excellent results. Other forms of iron would probably act equally well.

Strophanthus has been prescribed in many cases of **goitre**, two drops of the tincture three times daily were given with a rapid reduction in the size of the enlargements, and in some cases a cure. In **exophthalmic goitre** it has accomplished marked results and has become a permanent addition to the therapeutics of this disorder. The dose in these cases is from five to ten drops three or four times daily.

Uticaria is reported as having been cured with *Strophanthus* given in full doses. It is credited with the cure of several cases of **tetanus**. Clapp, in the London Lancet, reported a cure of traumatic tetanus after antispasmodics had entirely failed. In this case it had a marked diuretic effect.

Strophanthus is a mild local anæsthetic. It is only of service in operations upon the eye and not of great service here. Its effects are slow in appearing and remain long. In animals a cloudiness of the cornea is apt to appear after its use.

CONVALLARIA.

CONVALLARIA MAJALIS.

Synonym—Lily of the Valley.

Part Employed—The rhizome, the roots, the leaves and flowers.

Natural Order—Liliaceæ.

Locality—Indigenous to Europe and Asia. Cultivated in the United States.

CONSTITUENTS—Convallarin, Convallamarin, both Glucosides.

PREPARATIONS—Extractum Convallariæ Fluidum, Fluid Extract of Convallaria. Dose, from five to twenty drops.

Tinctura Convallaræ. Dose, from five to thirty minims.

Specific Convallaria is always made from the fresh root. It may be given in doses of from one to five minims in water, frequently repeated, giving good results, prescribed from one-half to two and one-half drams in four ounces of water.

All the preparations are stable in water except the fluid extract of the root. An infusion of the entire plant was used in the most of the original investigations made. It yields good results.

The Glucoside Convallamarin is given in doses varying from $1/12$ of a grain to one grain. The granules of $1/6$ grain afford an excellent form, as they may be dissolved in water if a smaller dose is desired, or one or more granules may be given at a dose.

Botanical Description—A low perennial herb, glabrous, stemless, with slender running rootstocks, sending up, from a scaly-sheathing bud, two oblong leaves, with their long sheathing petioles enrolled one within the other, so as to appear like a stalk; indigenous to Europe and Russian Asia from the Mediterranean to the Arctic circle; naturalized in the Alleghany Mountains of the United States, from Virginia to South Carolina. Cultivated extensively throughout the United States it has spontaneously appeared in several places. It has a creeping, whitish, much-branching rhizome of the thickness of a quill.

Physiological Action—A poisonous dose to a child produced great restlessness, rolling and tossing, continuous trembling of the arms and legs, and one attack of general convulsions. There was stupor, from which the child was roused by the greatest effort, to immediately relapse into it again on being left quiet. The pupils were moderately dilated, the temperature became subnormal, the pulse rapid and exceedingly irregular. The respiration was very regular but rapid, shallow or superficial. The face was flushed. The agent induced no diuretic or diaphoretic influence in this case and no gastro-intestinal irritation. Bogoyavlenski's extensive observations of the action of Convallaria upon warm-blooded animals were as follows: It induces a sudden retardation of the cardiac contractions, with increase of blood pressure. After the period of retardation there follows a strongly pronounced acceleration of the contractions with still greater increase of blood pressure, arrest of heart beat with diminution of blood pressure. When the vagi are previously divided the precursory retardation does not take place. If, during the period of acceleration of the contractions, the peripheral ends of the vagi are irritated, the usual effect on the heart is not observable.

In the left and right ventricles there was found an extravasation of blood under the endocardium. Under its influence the quantity of urine is much increased and dropsical exudates are

promptly absorbed and the weight of the patient lessened. The diuresis induced by the remedy continues long after cessation of its administration. The pulse grows fuller, more regular, and in some cases slower. It is not poisonous and has no cumulative action.

Specific Symptomatology—The direct therapeutic indications are **organic heart weakness** with **valvular inefficiency**, especially if accompanied with **dropsy**. It is probably an efficient remedy for **dropsical infiltration** wherever located, if due to inefficient heart.

Therapy—It strengthens the **heart's action**, slows a rapid and feeble pulse, corrects the rhyme and rhythm, improves the tone and increases the power of the heart, as evidenced by increased tonicity throughout the entire capillary circulation. It may be given for a few days and then discontinued for as many days, when its influence remains. Its influence is exercised in a regular, steady and permanent manner.

Its efficiency in **dropsy** is evidenced when there is sluggishness of the general circulation, with extreme inefficiency of the capillary circulation and greatly diminished blood pressure. In these cases if the kidneys are not seriously diseased, it can be made to induce extreme diuresis and give prompt relief.

It can be given with impunity and small doses should not be relied upon in extreme cases. If prompt effects are desired the tincture in full doses can be given in hot water, or an infusion of the entire herb will yield the best results. In some cases of chronic nephritis the kidneys will fail to respond to the action of the agent.

But these cases are necessarily extreme ones, as in many cases of **Bright's disease** most beneficial results are obtained from the use of this agent. It overcomes **general depression**, favors elimination, adds power and regularity of action to the heart, overcomes distress of breathing, conduces to rest and sleep, and induces a general sense of improved well-being.

It is an excellent remedy with which to improve the tone and vigor of the heart after the depressing effects of **protracted fevers** or violent acute inflammation, especially of the lungs and bronchi. It is useful also in the enfeebled heart of **phthisis pulmonalis**.

It is of much value in rheumatism, especially when the heart is involved. In **rheumatic carditis** or **pericarditis** it serves a double purpose. It strengthens and improves the tone of the heart, and favors the elimination of morbid products which cause the inflammation. But few remedies will act more efficiently. If there is effusion within the pericardium its influence will be quickly observed.

To sum up the influences of *Convallaria*: It is used to excellent advantage in the **tobacco heart** from cigarette smoking;

in the **bicycle heart** from overstrain; in **asthmatic breathing** from enfeebled heart, especially in **chronic asthma**. It does not, like digitalis, irritate the stomach unpleasantly. On the contrary, it is of much service in that form of dyspepsia in which there is extreme torpor of the stomach, with pale, flabby mucous membranes of the mouth, broad, thick tongue, with a heavy, dirty white coating. In conditions where the tongue is red, thin and irritable, with elongated papillæ, redness of the tip and edges, it is contraindicated. It is contraindicated also in fatty degeneration of the heart.

Germain-Sée mentions the following therapeutic indications:

In palpitation resulting from a state of exhaustion of the pneumogastric nerves—**cardiac paresis**, the most frequent source of palpitations.

In simple **cardiac arrhythmia**, with or without hypertrophy of the heart, with or without lesions of the orifices or valves of the heart.

In **mitral constriction**, especially when it is accompanied by failure of compensation on the part of the left auricle and right ventricle, the contractile force augments visibly under the Convallaria, as the sphygmograph testifies.

In **mitral insufficiency**, especially where there are pulmonary congestions, and when, as a consequence, there is dyspnœa, with or without nervous trouble of the respiration.

In **dilatation** of the left ventricle, without compensatory hypertrophy, it restores energy of the heart, which tends to become more and more feeble and dilated. In **dilatations** of the heart, with or without fatty degeneration, with or without sclerosis of muscular tissue, the indications for Convallaria majalis are clear.

In all **cardiac affections** indifferently, from the moment that watery infiltrations appear, Convallaria has an action evident, prompt and certain.

In lesions with **dyspnœa** the effect is less marked. To combat cardiac dyspnœa, Convallaria is inferior to Quebracho. The combination of Convallaria majalis with iodide of potassium in the treatment of **cardiac asthma** constitutes one of the most useful methods of treatment. One is often obliged to suspend the employment of digitalis on account of vomiting, digestive disturbances, cerebral excitation, the dilatation of the pupil, which it so often produces after prolonged use. No such results obtained from the use of Convallaria.

LYCOPUS.**LYCOPUS VIRGINICA****Synonym**—Bugleweed.**Part Employed**—The herb.**Natural Order**—Labiatae.**Locality**—United States, Canada.

Botanical Description—Bugleweed is a perennial herb, growing in woody, moist places, and flowering from July to September; stem smooth, straight, obtusely quadrangular, with slender runners at the base, twelve to eighteen inches in height; leaves opposite, one inch long, ovate, entire, toothed, wedge-shaped and entire at the base, glandular—paniculate beneath; flowers small, purplish, four-lobed, in dense axillary whorls; corolla campanulate, four-cleft, emarginate; calyx, tubular, four-cleft, with four ovate, pointless teeth; odor mint-like, taste bitter, slightly aromatic. Solvents, water, alcohol. Dose, five grains.

CONSTITUENTS—Volatile oil, bitter principle, gallic acid, tannin.

PREPARATIONS—Specific Lycopus. Dose, from one to twenty minims.

The principal therapeutic influence of *Lycopus* seems to be upon the thoracic viscera, and consequently upon all lesions having diseases of these organs for their basis. The use of the *Lycopus* may be confined to certain fixed indications with better results than follow its indiscriminate use in any general class of cases, regardless of conditions.

Specific Symptomatology—In diseases of the **heart**, either functional or organic, marked by **irritability** and **irregularity** of the organ, **dyspnœa**, feeling of oppression in the cardiac region, its administration is followed by gratifying results. Hypertrophy and dilatation have been known to undergo marked diminution in consequence of its administration.

Therapy—It possesses tonic, sedative, astringent and narcotic properties, and has been successfully used in **incipient phthisis**, **hæmoptysis**, etc. It acts like digitalis in reducing the velocity of the pulse, but has no cumulative effects. In pericarditis and endocarditis its sedative action lessens the frequency of the pulse, irritability, and its attendant inflammation, in a manner equaled by no other remedy.

Cases of **exophthalmic goitre** are reported as having been cured by *Lycopus*, and it would be well to give it a thorough trial in this most intractable disease.

Goss said that in palpitation and valvular disease of the heart, *Lycopus* is good; in **hæmoptysis** it is so positive in its action that he seldom used any other remedy. He considered it a sedative as well as an astringent in its action, controlling the capillary circulation by diminishing the caliber of the vessels, thereby reducing the flow of the blood.

In diseases of the respiratory apparatus *Lycopus* has been found to be very useful. *Hæmoptysis*, associated with rapid and tumultuous heart's action, yields readily to its influence, as does **hemorrhage** from any part. Hale lauds *Lycopus* highly for its efficiency when used in cases of **incipient phthisis** and in chronic inflammatory diseases of the lungs. By regulating the heart's action and equalizing the circulation in the lungs it mitigates or arrests the local inflammation.

Chronic **irritable cough**, arising from a smouldering inflammation in the lungs, can be cured by its administration. It has been used repeatedly in the high temperature of **typhoid fever** with uniformly good results; it not only effectually reduced the excessive heat, but in so doing, it did not depress in the least the vital forces of the patient.

To a certain extent it acts on the heart as a nerve sedative by lessening its action, also by constricting the blood vessels; hence, diminishing the flow of blood. We have in this valuable remedy much that is expected of *aconite* or *veratrum*, *antipyrin*, *antifebrin*, as an agent to reduce the heat in high temperature without many of their baleful effects. The dose is from one to five drops, every two to four hours. It is not necessary to give it regularly—only as indicated.

It is also good in hepatitis, if complicated with pneumonia, in two-drop doses, once every three hours. In **hæmaturia**, if associated with calculi or catarrh of the bladder, *Lycopus* is of benefit alternated with *chimaphila umbellata*.

It is decidedly beneficial in the treatment of **diabetes**, curing a few cases after all other remedies have failed. It has proven beneficial in **chronic diarrhœa** and **dysentery**, inflammatory disease of drunkards and in intermittents. It promotes digestion, invigorates the appetite, allays gastric and enteric irritability.

ADONIS.

ADONIS VERNALIS.

Synonyms—*Adonis Apennina*, Pheasant's eye.

Part Employed—The herb.

Natural Order—*Ranunculaceæ*.

Locality—Southern and Eastern Europe and Siberia.

PREPARATIONS—*Adonidin*. Dose, from $1/10$ to $1/3$ grain.

Fluid Extract of *Adonis Vernalis*; miscible in water without material precipitation. Dose, one to two minims.

Specific *Adonis*. Dose, from one-fourth of a minim to one minim. It is usually prescribed: ten drops in four ounces of water, a teaspoonful every two hours.

Botanical Description—The genus *Adonis* belongs to the great family *Ranunculaceæ*. It grows throughout Europe and Southern Siberia. No species are found in the United States.

The calyx is appressed, five sepals; sepals sometimes united at the base. Petals five to fifteen with naked claws. Stamens, variable in number, hypogynous. Carpels variable in number, becoming one-seeded and partly accrescent, ovate acuminate, with a short style. Cauline leaves pinnately parted. Carpels are curved, style recurved, petals eight to fifteen with perennial root.

Adonidin—The constituents of Adonis were studied by Cerverlo, who obtained from it only one active substance, which he named "Adonidin." This substance is extremely energetic, and seems to be present only in small proportion. It is a non-nitrogenous, colorless, odorless, and extremely bitter amorphous powder.

Physiological Action—From a careful, clinical and physiological study of the effects of Adonis Vernalis, Dr. Budnow concludes that the active principle excites the inhibitory nerves in the heart at the central end; that its further action is to paralyze the peripheral end of the vagus; that it likewise excites the accelerating nerves, sometimes directly (through the blood pressure), sometimes indirectly; that at the moment of the vagal paralysis, the two systems of cardiac innervation interfere; that at the termination of the toxic effect, paralysis of the motor nervous apparatus of the heart occurs; that after death there is either complete loss of excitability or the cardiac muscle is very much weakened.

Durand sums up his observations as follows: In doses of $1/3$ grain Adonidin increases arterial tension, regulates the heart beat, diminishes the frequency of the pulse, increases the force of the cardiac contractions, acts with rapidity, its effect being present only during administration, increases diuresis, is well tolerated, but increased doses irritate the stomach.

He commends its use especially in mitral insufficiency and interstitial myocarditis, and in palpitation of the heart.

Therapy—The agent is of value in those conditions which result from imperfect arterial tension, due to **incompetent heart action**. It is useful in many cases of **dropsy**, especially if the kidneys are inefficient in their action. It contracts the enfeebled and dilated heart muscle and improves its tone. In general dropsy its influence is quite as satisfactory as that of the other heart remedies, probably however, not more so than digitalis, although its diuretic influence is sometimes great. In those cases in which digitalis fails to produce diuresis, the diuretic influence of Adonis Vernalis is more constant. It is valuable in **irregularity of the heart** and in **dyspnœa from feeble heart**. It is also serviceable in dyspnœa from **asthma** with cardiac feebleness. It has produced marked results in these cases.

It has been advised by some prominent authorities in the

treatment of **epilepsy** The following formula has been suggested:

Forty grains are dissolved in five ounces of water and filtered. To this are added 160 grains of potassium bromide and three grains of caffeine. A teaspoonful of this four times daily has cured some stubborn cases. The agent is often given in infusion.

CHAPTER II.

SPARTEINE.
CAFFEINE.

APOCYNUM.
CRÆTAGUS.

ANHALONIUM.
IBERIS AMARA.

SPARTEINE.

Formula— $C_{15}H_{26}N_2$.

Description—Obtained from the distillation of a concentrated infusion of the tops of the *cytiscus scoparius*, or from the mother liquor after precipitating scoparin. It is a colorless liquid of an oily consistence, soluble in alcohol, ether and chloroform.

Sparteine Sulphate.

Description—A crystallized product from the action of sulphuric acid on Sparteine. It is crystalline, or a white powder, neutral, odorless, bitter, deliquescent, soluble in water and alcohol. Dose, from one-tenth to one-half of a grain.

Physiological Action—The agent has a profound influence upon the nerve centers, thence upon the heart. It quickens the pulse rate, increases arterial tension, augments the force of the muscular contraction of the ventricles, and increases the movement of the blood through the arterioles. It stimulates the action of the kidneys to a marked degree and produces mild diaphoresis. In overdoses it produces muscular trembling, inco-ordination, emesis, catharsis, and finally paralysis of the respiratory and motor centers. The heart is stopped in systole.

Therapy—Sparteine is a remedy for weak heart with muscular feebleness. It is useful in palpitation from heart strain and exhaustion. It has been used in Graves' disease, and is thought to be of much value in this trouble. Simple goitre also may be benefited by it. It produces its effects quickly, and the influence remains for several hours. It is a diuretic, removing dropsical effusion where it results from feebleness of the circulation. It is not a remedy to be depended upon in all cases.

CAFFEINE.

Formula— $C_8H_{10}N_4HO_2O_2$.

Synonym—Methyltheobromine.

Occurrence—The proximate principle obtained from dry tea leaves, coffee, guarana sorbilis, and from other plants. It occurs in larger proportion in the tea leaves than in the coffee berry. The difference in the effects of coffee and tea upon the system, occurs from the presence of an empyreumatic oil in the coffee, which develops active properties by roasting.

Description—Caffeine occurs as long, white, flexible crystals in fleecy masses of a silken luster, slightly bitter in taste, odorless, and permanent in the air, soluble in eighty parts of cold water and in two parts of boiling water, thirty-three parts of alcohol, and seven parts of chloroform. Heated to the boiling point of water it loses its water of crystallization, and at 444 deg. Fah. it fuses, forming a colorless liquid.

Caffeine citrate is formed by the solution of Caffeine in citric acid. It is probably a mixture of the two substances and not a chemical compound. It is a white powder, odorless, slightly bitter, and acid in reaction.

Mixed freely with water it is unstable and apt to precipitate. With only three parts of water it forms a syrupy solution, more permanent. When the precipitated liquid is increased by the addition of more than twenty-five parts of water, it will then remain in permanent solution.

Physiological Action—Caffeine acts upon the reflex centers of the spinal cord. It increases the temperature at first, afterwards diminishing it. It stimulates the cerebral functions, causing rapidity and facility of mental action. It produces nervousness and wakefulness. It has no true tonic effect. It raises the blood pressure and increases the pulse rate, acting as a direct stimulant to the muscle of the heart. It increases the solids in the urine by stimulating the epithelium of the tubules.

It actively stimulates the respiratory centers. This influence is required where there has been marked depression of the nervous system, and where motor depressants have been taken as poisons. It is given in conjunction with morphia to prevent any after depressing effect of this agent on the heart's action. It is given in many cases of headache, the effervescent citrate being a popular remedy, one used by the laity almost indiscriminately.

Therapy—Caffeine is a direct **heart stimulant**. It is given to support the heart in extreme feebleness or threatened failure. It is given in conjunction with remedies which are apt to have a depressing effect upon the heart, to sustain it against such depression. In **feeble heart** from dilatation, valvular insufficiency or fatty degeneration, and in **dropsy** resulting from

the above conditions, with deficient capillary tonus, this agent is an excellent remedy.

In **exhaustion** from prostrating disease, with weak heart, this agent will exercise a positive influence in the general restoration of the patient, through its strengthening action on the heart.

It is given in some cases of **asthma** where there is exhaustion from feebleness of the respiratory nerves.

It is given to dispel the **drowsiness** common to some individuals after eating a hearty meal. It is a remedy for **melancholia**, hypochondriasis and despondency.

It is a valuable remedy in general **lithæmic** conditions, as it assists in the elimination of urea and uric acid.

The main objection to the use of the remedy in these conditions is its inclination to produce persistent wakefulness. In extreme doses it sometimes produces a mild form of delirium, with palpitation, general tremor and tinnitus aurium.

It is important in **uremic coma**, which causes depression of the heart and respiratory functions. It should be given hypodermically, in doses of from one-eighth to one-half a grain. It may be used in conjunction with other active eliminants.

Caffeine Citratis Effervescens—Effervescent Citrate of Caffeine. This popular combination for the administration of Caffeine is made by triturating together a hundred and fifty-four grains each of Caffeine and citric acid, eleven and a half ounces of bicarbonate of soda, ten and a half ounces of tartaric acid and twelve ounces of sugar, finely powdered. After thorough trituration, alcohol is added in sufficient quantity to make a soft paste. It is rubbed through a No. 6 galvanized iron sieve, and when dried is reduced to a coarse powder. It contains one per cent of Caffeine. It is kept in a cool, dry place, in well-stoppered bottles, and is given in teaspoonful doses dissolved in a glass of water. It is a most pleasant method of administration. It is more commonly prescribed in the treatment of **headaches**, especially if caused by an acid condition of the stomach.

In mild cases of **palpitation** of the **heart** of a functional character, usually depending upon gastric derangement, this agent will be found advantageous.

APOCYNUM.

APOCYNUM CANNABINUM.

Synonym—Canadian Hemp.

Part Employed—The root.

Natural Order—Apocynaceæ.

Locality—United States, Canada.

Botanical Description—*Apocynum Cannabinum* is a perennial herb growing in fields and grassy places, and flowering from

May to August; stem smooth, often purplish, three to four feet high, rather erect; branches straight, long, slender; leaves oblong or linear-oblong, opposite, mucronate, acute, two or three inches long, three-fourths of an inch broad, on short petioles, downy beneath when young; flowers numerous, greenish-white, arranged in cymes; corolla bell-shaped, five-cleft, tube the length of the calyx; fruit, two slender follicles, containing many narrow silky-tufted seeds; root several feet long, branched, with few fibers, brownish-gray, internally white, longitudinally wrinkled, transversely furrowed, brittle, fracture short, bark rather thick, wood porous, spongy, with delicate medullary rays; taste bitter, nauseous. Solvents, water, alcohol. Dose, from five to fifteen grains.

CONSTITUENTS—Apocynin, apocynin, tannin, gallic acid, gum, starch, resin, wax.

PREPARATIONS—Decoctum Apocyni, Decoction of Apocynum. Dose, from half a dram to one dram. Specific Apocynum. Dose, from $\frac{1}{2}$ of a minim to twenty minims.

Physiological Action—Whether this agent acts most directly upon the heart or upon the kidneys is an unsettled question except to those who have used it in cases where the heart was greatly enfeebled and relaxed, and when dropsy resulted from that condition. It is certainly an excellent heart tonic in such cases, improving the strength of the heart muscle, the character and force of the pulse, and increasing to a most marked extent the arterial tonus. It strengthens the nerve force, improves the respiration, and facilitates oxidation of the blood. Its influence is similar to convallaria or digitalis, and it acts in harmony with cactus, the influence of both being increased.

French authorities say that this agent is a violent cardiac poison, which in large doses stops the heart in complete systole, and in small doses slows the beats and strengthens their force. They believe that it contains an active principle which acts as does digitalis, with, however, these differences, that it is not cumulative, and when administered in a medicinal dose it does not give rise to any inconvenience excepting some headache. Froment has reported ten instances of diverse cardiac disease in which the pulse was slowed, the rhythm was made regular, the arterial tension was raised, and edema disappeared; in certain cases it acted when strophanthus and tincture of convallaria had failed. It seems to be useful in certain febrile conditions where the frequency of the pulse gives rise to anxiety, notably so in pulmonary tuberculosis, although a large dose may increase the diarrhoea if present.

Its influence upon the kidneys is exercised, however, when heart symptoms are not conspicuous. It produces a greatly increased flow of limpid urine without irritating the kidneys. There is no hematuria or other evidence of forced action or marked

renal congestion. In profound doses it has caused suppression of the urine.

The agent exercises a hydragogue influence both upon the kidneys and bowels. In large doses it irritates the stomach, producing violent prostrating emesis. As an emetic or cathartic it is too harsh and should not be used. We have more efficient and milder remedies.

Specific Symptomatology—Dropsy is the condition for which this agent should be used with puffiness of the face beginning in the cellular tissues under the eyes, puffiness of the hands and feet, followed by general dropsical effusion. Dropsy caused by defective kidney action yields first, provided too much structural change of the kidneys has not occurred.

In **acute inflammation** of the kidneys, where dropsy appears before the kidney lesion has been diagnosed, as often occurs in post-scarlatinal nephritis, it is prompt in its action, but the kidney inflammation must be combated with other remedies. In dropsy depending upon **feeble heart**, with impaired blood pressure and deficient capillary action, the influence of Apocynum is fully as marked as in the above condition.

Therapy—In the latter stages of heart diseases where **hydro-pericardium** is present, with other local or general effusions, it is prompt and efficient in its action, as it most materially strengthens the heart and improves the character of the circulation, while it removes the effusion and consequent oppression.

It has been used in all local dropsies. It has cured several cases of **hydrocephalus**, and it should be tried in these cases.

In females where there are greatly relaxed or flabby tissues, **anæmia**, and a tendency to **metrorrhagia** or **menorrhagia**, with some little effusion in the ankles, with feeble kidney action, Apocynum influences all the conditions. If iron is added for the anæmia the influence will be prompt and satisfactory. It has considerable reputation in the control of passive **hemorrhage** among certain physicians.

Apocynum has cured many stubborn, intractable and very severe cases of sciatica. We do not undertake to explain its action in this disease. Half a dram of the specific Apocynum added to four ounces of water, a teaspoonful every half hour, resulted in relief after a few doses. It should be tried faithfully in stubborn cases.

Administration—It may be necessary to vary the form of the remedy in its administration in certain cases before a marked result occurs. The specific Apocynum seldom fails. It may act promptly in doses of from one-half to one drop frequently repeated, and it may be necessary to give five drops or more at a dose, but close watch must be kept on its action upon the bowels that it be not too severe and prostrating. The agent

has a general tonic influence which so sustains the body forces that considerable violence of cathartic action can be obtained in some cases, without marked depression, but usually this violent action should be avoided.

Fluid extracts are usually unreliable and uncertain in their action, some acting promptly, others producing marked irritation and depression, and still others being inert. If the fresh root of the *Apocynum* can be obtained, an infusion of one ounce to the pint of water may be made, and from a teaspoonful to a tablespoonful of this infusion given often and increased or diminished as indicated. In some cases very small doses are very efficient. A tincture carefully prepared from the fresh root sometimes is the superior preparation.

CRATÆGUS OXYACANTHA.

Synonyms—Hawthorn, Haw, English Hawthorn.

Part Employed—The fruit.

Natural Order—Rosaceæ.

Location—Europe and North America.

PREPARATIONS—Specific *Oxyacantha*; dose, from five to twenty minims. Fluid Extract *Oxyacantha*; dose, from ten to fifteen minims. Normal Extract; dose, from four to eight minims. It is given in water and may be repeated every hour or every two or three hours. In extreme cases it may be given hypodermically.

Botanical Description (Bentham & Hooker, Fifth Edition)—This species is common in woods and thickets throughout Europe and Central and Russian Asia. It is abundant in Great Britain, where it is universally cultivated for hedges. The genus is spread over the north temperate regions of the globe, but is more abundant in America than elsewhere.

It is composed mainly of shrubs, seldom growing into trees, armed with thorns formed of abortive branches and differing from *Pyrus* (apples and pears) only in the hard, bony consistence of the cells of the fruit. This species is a thorny shrub or small tree, glabrous, or more or less downy on the calyx and young leaves. Leaves variable, but more or less three to five-lobed and irregularly toothed, narrowed at the base, stalked. Flowers white or pink, sweet-scented, in sessile corymbs on short leafy branches, petals broad. Fruit red, globular, containing a single hard bony nut, which is one or two-celled and one or two-seeded.

Therapy—This agent has as yet hardly received the attention of the profession. Dr. Jennings, of Chicago, in October, 1896, published in the New York Medical Journal a letter containing the following statement:

"There lived in the city of Ennis, County Clare, Ireland, until about two years ago, a prominent physician named Greene, who was well and favorably known over the greater part of Ireland and parts of England and Scotland for his reputed ability to cure heart disease.

"It was found after his death that he had accomplished these cures solely with a fluid extract made from the *Cratægus Oxycantha*, or hawthorn fruit. My brother, who resides within a few miles of Ennis, having informed me of these things, I immediately wrote him, requesting that he send me some of the fruit, to be used for testing the efficacy of the remedy, which he did. I made a fluid extract according to the British Pharmacopœia, and have used it up to the present on forty-three patients suffering with various forms of heart disease, and I must say with the most gratifying results."

Dr. Jennings began at once the most vigorous investigation of the action of this remedy. A few months later he wrote:

"To this date I have successfully treated one hundred and eighteen patients who were suffering with various forms of heart disease, not including fatty degeneration and tachycardia, and of the two latter forms of the disease I have fourteen still under treatment.

"Of one hundred and fifty-seven reports from other physicians using the drug in their practice, all but nine are commendatory and favorable, and of the nine, eight of them discontinued its use because the medicine made them sick at the stomach, and the ninth, a physician, said it gave him a fullness in the head. If these latter had reduced the dose to five or six drops it would have had full therapeutic effect, and would have obviated the nausea, and they, too, could then have reported favorably.

"From these results my deductions are that *Cratægus Oxycantha* is superior to any other of the well known and tried remedies at present in use in the treatment of heart disease, because it seems to cure while the other remedies are only palliative at best.

"*Cratægus* may be regarded as a specific, or the nearest approach to a specific, in the following cardiac diseases: Angina pectoris, valvular deficiency, with or without enlargement, endo-myocarditis, pericarditis, tachycardia, rheumatism (so-called) of the heart, cardiac neuralgias, from whatever cause, palpitation, vertigo, apoplexy, dropsy and functional derangements.

"The dose of ten to fifteen drops, heretofore announced, is too much, and a dose of from four to eight drops, four times a day, is to be substituted."

Jennings advises the use of tonics and auxiliary agents to meet the indications in extreme cases of heart disease, where a long train of symptoms has developed from the imperfect circulation and deficiency of oxygenation of the blood. He says

in treating heart disease, he was strikingly impressed with the rapidity with which cardiac dropsy disappeared under the influence of *Cratægus*. From this he was naturally led to believe that the same treatment would be equally efficacious in dropsies not of cardiac origin, and he now confirms, clinically, this obvious conclusion. He has also used *Cratægus* with the greatest of success in albuminuria or Bright's disease, and in diabetes mellitus and insipidus.

Dr. Joseph Clements, of Kansas City, Mo., wrote to Dr. Jennings for information concerning the remedy, and began taking it. The report of his case was published in the *Kansas City Medical Record* in April.

It was an extreme case of angina pectoris, with regurgitation, edema and a train of symptoms that pointed to immediate dissolution. After using cactus and other well known heart remedies without any result, he obtained some of Jennings' fluid extract, and was cured in a few weeks, with permanent relief from the pain.

Dr. Clements says that his experiments have shown that the drug also has a wonderfully solvent power on crustaceous and calcareous deposits in the lumen of the arteries, resembling the effect of iodide of potassium on the nodes of syphilis.

He says, further, "a drug whose physiological action and therapeutic power are solvent and absorptive to the diseased accumulations, and tonic and stimulative to its nutritive nerve supply, must approach the nature of a specific as near as anything can approach it, in the disease under discussion."

Some observers claim that the use of this remedy in aged persons, with arterio-sclerosis, angina pectoris, etc., will prolong their lives beyond the time when dissolution would have been certain had those conditions remained.

What would be the effect of the medicine in fatty degeneration, atheroma, etc., I am not prepared to say. I think further observation will be necessary before it would be safe to go far with it. In small doses, however, its tonic effect upon the nerve supply, I think, could not be otherwise than helpful.

In beginning heart mischief after attacks of inflammatory rheumatism we will find a promising field of usefulness for this new remedy."

Those who have since used the remedy believe it to be a true heart tonic and restorative, and capable of exercising an immediate soothing and strengthening influence upon that organ, thereby improving the circulation, and augmenting oxygenation of the blood. Future experience will determine its merit.

ANHALONIUM.**Synonym**—Muscale Buttons.**Part Employed**—The plant.**Location**—Mexico.

Botanical Description—One of the small cacti, native to Mexico. It is less than an inch in height, and about an inch and a half broad, with knotty protuberances. The plant is crowned with a grayish, dirty white cushion, from which the blossoms protrude. The fruit is an oblong berry containing fourteen small seeds.

The plant contains an alkaloid—*anhalonine*, and probably other active principles.

Physiological Action—The agent acts profoundly upon the nervous centers in full doses of the tincture or fluid extract. It increases the activity of all the reflexes and produces spasm with slow heart, coldness of the extremities, and respiratory failure.

Other varieties of the cactus family which are comparatively well known, especially the *cactus grand* or *cactus bonplandi*, are remedies having a specific effect upon the heart also, resembling the influence of *Anhalonium*. This agent, like *aconite*, reduces the force and frequency of the pulse, and if continued too far, acts upon the heart as a general depressant. At first the surface seems cool, but finally there is a general warmth, extending to the extremities, the capillary circulation becoming very free. It produces free, regular and deep breathing without oppression, followed by drowsiness and natural sleep. It sustains the respiration and stimulates the functional activity of the heart by increasing its actual tonicity.

It seems to produce some excitement if given in full doses to nervous patients, but in plethoric individuals these effects are not observed.

Therapy—In *angina pectoris*, *asthma* or *acute asthmatic dyspnœa* or *dyspnœa* from *cardiac feebleness*, and in *pneumothorax*, it produces excellent results. *Cactus grand* is a special sedative under certain circumstances, and this agent promises to be as good. It has a direct action on the feeble, irregular and intermittent heart. It deserves careful investigation in those lines in which *cactus grand* exercises its therapeutic influence.

ANHALONIUM LEWINI.**IBERIS.****Synonym**—Bitter Candytuft.**Part Used**—The plant.**Natural Order**—*Cuciferae*.**Location**—Europe.**PREPARATIONS**—The powdered plant. Dose from one to**IBERIS AMARA.**

three grains. *Tinctura Iberis Amaræ*. Dose, five drops, increased or decreased as indicated.

Botanical Description—The plant is smooth, glaucous, with a branching stem about two feet high. The leaves are petiolate, incisely serrated, radical, two inches in length, the stem entire; small white flowers in racemose cymes. The fruit small, ovate, acute.

CONSTITUENT—Lepiden, a bitter principle.

Therapy—The most direct action of this remedy is upon an **enlarged heart**, where there is functional weakness. It lessens the force of the heart's action, controlling violence and irritability. It overcomes the **dyspnœa** of these cases, the vertigo and general sense of weakness, with other reflex symptoms.

In **bronchitis, asthma, dyspnœa**, and in jaundice or dropsy, all of cardiac origin, it is said to be one of our best agents, in some cases acting magically. Galen used it in rheumatic affections. The agent has not received the attention it is said to deserve.

GROUP III.

Agents Acting upon the Respiratory Tract.

CHAPTER I.

Nauseating Expectorants and Respiratory Sedatives.

LOBELIA.	SQUILLS.	QUEBRACHO.
SANGUINARIA.	TARTAR EMETIC.	CENOTHERA.
IPECAC.	GRINDELIA.	VASCA.

LOBELIA.

LOBELIA INFLATA.

Synonym—Indian Tobacco.

Part Employed—The whole plant.

Natural Order—Lobeliaceæ.

Locality—North America.

Botanical Description—An annual herb, one to two feet high, flowering from July to September; root, fibrous; stem erect, paniculately branched, solitary, angular, with spreading hairs; leaves, one to three inches long, scattered or alternate, petiolate, upper sessile, ovate, dentate, pale-green, pubescent; flowers numerous, small, disposed on leafy terminal racemes, and upon short axillary footstalks; calyx five-toothed, superior, adherent to the ovary, and becomes inflated in the fruit; corolla bilabiate, of a delicate blue color; the five stamens are free from the corolla, and by the union of the filaments and anthers form a tube which incloses the single style; fruit oval, striated, inflated subglobular capsule, which is two-celled; opens at the apex, and contains a large number of minute brown, oblong seeds, the surface of which has, under the microscope, a reticulated appearance; odor slight, taste acrid. Solvents, alcohol, water; dose, from one to twenty grains.

CONSTITUENTS—Lobeline, Lobelacrin, Lobelic acid

PREPARATIONS—Extractum *Lobeliæ* Fluidum, Fluid Extract of Lobelia; dose, from one to ten minims.

Tinctura Lobeliæ, Tincture of Lobelia; dose, from five to thirty minims.

Specific Lobelia; dose, from one to twenty minims.

Lobelia is an ingredient in many compound preparations of approved value, and in common use among Eclectic physicians, as the compound powder of Lobelia and capsicum, compound

liniment of stillingia, compound acetated tincture of sanguinaria, compound tincture of Lobelia, etc.

Physiological Action—Lobelia in toxic doses causes extreme prostration, burning pain in the œsophagus, rapid, feeble pulse, fall of temperature, collapse, coma or convulsions and death from respiratory failure. Moderate doses cause dizziness, nausea, vomiting, headache and general tremors. In doses of twenty grains it is a prompt emetic, but emesis is accompanied by excessive prostration, relaxation and a feeble pulse. In small doses it causes increased expectoration and diaphoresis. Like other narcotics, a small dose stimulates, while a large dose depresses the nervous system.

Although usually classed among emetics, Lobelia is a nerve depressant of great power, and to this its influence as a general relaxant, in which it is exceeded by but few remedies, is due.

Death has occurred in a very few cases from excessive doses of the remedy, but toxic effects are not apparent where the medicinal dose is prescribed. Where death has occurred, its influence as a nerve depressant has been plainly shown in the profound, general muscular relaxation, with greatly impaired muscular power, general trembling, shallow respiration, cold, clammy skin, feeble and depressed heart action. It acts like tobacco and physostigma upon the respiration, the heart's action continuing after the respiration has ceased. Paralysis of the respiratory nerves is its prominent influence.

Specific Symptomatology—This influence makes this remedy a specific in irritable, spasmodic and **oppressed breathing**, and in respiratory disorders from exalted nerve force and nerve irritation.

It is contraindicated in general relaxation and in dyspnoea from enlarged or fatty heart, or from hydropericardium, or enfeebled heart, with valvular incompetence. It is specific in threatened **spasm** with exalted nerve action—a high degree of nerve tension with great restlessness and excitability, flushed face and contracted pupils. It is a prompt emetic in full doses, but depressing in character.

Therapy—In **spasmodic asthma**, if given in a dose of from thirty minims to one dram during the paroxysm, the benefit is apparent almost immediately. Small doses are of but little or no benefit in such a case. This full dose may be once repeated, but this is seldom necessary, and a single dose seldom produces vomiting. It is useful in asthmatic breathing. When continued with other agents it must be given in doses not to exceed ten minims three or four times a day.

Lobelia is of value in **whooping-cough**. It is a reliable expectorant, and either alone or in combination with other indicated remedies, is useful in all cases of dry, hard, barking cough,

or where the expectoration is difficult to raise, in **spasmodic croup**, and in **membranous croup** without depression.

Children are less liable to be unpleasantly affected with Lobelia than adults.

Its action as an **emetic** is most profound. It is not so commonly used at the present time for that purpose as ipecac, as the irritation, nausea and general depression are usually greater than is necessary.

It resembles tobacco in this and in many other particulars. It produces a burning sensation in the fauces which is persistent and unpleasant.

Either alone or combined with tincture of capsicum, it has long been used to overcome **spasms** of all characters, from **infantile convulsions** to **puerperal eclampsia** and **epilepsy**.

It has been given in **tetanus** with benefit, and with success in the spasms of **hydrophobia** and of strychnia poisoning,

Because of the great importance placed upon this remedy by Thompson, and the violent opposition which followed his endorsement, it has been openly decried by the regular profession for sixty years, and denounced because of its inactivity in small doses, and declared to be a profound poison in full doses. If it had been given fearlessly in full, large, single doses, the best of results would have occurred.

As a remedy for hysteria, **hysterical paroxysms** and **hysterical convulsions**, the combined tinctures of this remedy and capsicum have no superior. It will immediately terminate many paroxysms and quickly control convulsive attacks.

This agent has in the past been exceedingly popular as a relaxant in **rigid os uteri**. Very many cases are on record of almost immediate relaxation and rapid termination of labor after its use. In these cases there is the objection that it produces nausea and general relaxation and may encourage post-partum hemorrhage. This result may, however, be easily prevented.

The compound tincture of lobelia and capsicum, which is antispasmodic without inducing depression, is made by macerating two ounces each of lobelia, capsicum and symplacarpus foetidus, in two ounces of dilute alcohol, and percolating. It may be made from the tinctures of the substances named.

It is an excellent **cough remedy**, but should not be given in doses sufficient to produce nausea. One or two drops at a dose will produce expectoration and relieve many irritable coughs. It is of much service properly combined with other indicated remedies.

A very popular remedy with the older physicians was the **acetous tincture of bloodroot and Lobelia**. This was made according to the old method, by macerating two ounces each of bloodroot, Lobelia and skunk cabbage root, in two pints of vin-

egar, to which two ounces of alcohol was added. This may be extemporaneously prepared by using the tinctures of these substances in dilute alcohol with a small quantity of acetic acid. This preparation is valuable as a cough remedy and an expectorant. It is very useful in croup and in tight coughs.

Lobelia was at one time popular as a sedative in all sthenic fevers. It was in every way superior to any method in vogue, when Thompson introduced it for that purpose, more than a century ago. It produced relaxation, and by emesis and catharsis cleansed the stomach and intestinal canal. It was given in hot infusion, and usually produced profound diaphoresis. Stimulants then followed to overcome its depression, and the patients, especially in malarial cases, were at once markedly benefited.

Five drops of specific Lobelia in two ounces of water, a half teaspoonful every few minutes, given warm, will cure many cases of **infantile colic**, from whatever cause, will soothe nervous irritation and induce sleep. It is indicated when the child screams or cries out suddenly, when there is no apparent cause for the pain.

Lobelia is advised in the treatment of **angina pectoris** where there is no marked enfeeblement. It must be given in sufficient doses to produce immediate results, and must not be persisted in.

If the tincture of Lobelia be applied to a **felon** before pus has formed, and kept in constant contact, it will often abort it.

One ounce of Lobelia tincture in a pint of water applied to an inflamed surface **poisoned** with **rhus tox.**, will exercise a rapid curative influence.

SANGUINARIA.

SANGUINARIA CANADENSIS.

Synonym—Bloodroot.

Part Employed—The rhizome.

Natural Order—Papaveraceæ.

Locality—North America, Canada.

Botanical Description—Bloodroot is abundant in hilly places, growing in rich soil and shaded woods from Canada to Florida, presenting very elegant flowers from March to June. In early spring the rhizome sends up one or two leaves and a slender scape about four to six inches high, bearing a single large white flower. The leaves are three inches long, four or five inches wide, palmately seven to nine-lobed, smooth, on long channeled petioles, reniform, cordate, seven to nine-veined, light green above, glaucous beneath; flowers white, odorless; sepals two, fugacious; petals eight to twelve; stamens in several rows; fruit, which ripens in June, is an oblong

two-valved capsule, tapering at each end, and containing numerous, dark shining, red, roundish seeds, with a strongly crested raphe; rhizome horizontal, two to four inches long, two-fifths of an inch thick, cylindrical slightly branched, annulate, covered with orange-colored fibers, two or more inches in length; after drying, reddish-brown, fracture short, waxy, whitish, with many small resin cells, brownish red, bark thin, vascular bundles small, pith large; odor slight; taste bitter, acrid. The fresh root contains an abundance of orange-colored juice, which flows out when the root is cut. The fresh root only should be used, as it deteriorates rapidly with age. Solvents, alcohol, vinegar, water. Dose, from one to ten grains.

CONSTITUENTS — Sanguinarine, chelerythrine, protopine, citric and malic acids.

Physiological Action—In excessive doses bloodroot produces burning and racking pains in the digestive canal from the mouth to the stomach; insatiable thirst, dilated pupils, nausea, an anxious countenance, coldness of the extremities, cold sweats and more or less diminution of the pulse, with irregularity.

Specific Symptomatology—The influence of Sanguinaria is restricted to rather narrow lines. In harsh, dry cough with relaxed tissues of the pharynx, larynx and bronchi, with a sense of constriction and constant irritation and uneasiness or tickling in the throat, this agent is useful.

Therapy—It is a tonic and stimulant to the bronchial membranes. It stimulates the capillaries and overcomes **congestion** of the **lung** structure, after a severe cold in the chest from exposure. An improvised syrup made from adding a dram of the tincture of Sanguinaria and two drams of vinegar to two ounces of simple syrup will relieve the chest sensations quickly if taken in teaspoonful doses every half hour or hour.

It is not as useful a remedy in diseases of children as ipecac or lobelia, as the harshness of its action in full doses is not well borne. If combined with either of these agents, and given in small doses for exactly the same purposes for which they are suggested, it will furnish the tonic and stimulant influence of the combination. There will be less nausea from the ipecac and less general relaxation from the lobelia. Given with the syrup of ipecac in hoarse **bronchial coughs**, or **stridulous laryngitis**, or in the early stage of croup, it will enhance the expectorant influence of ipecac, and prevent, in part, the cold skin and depressing influence of that agent. It equalizes the circulation of the entire system, inducing warmth in the skin and in the extremities.

In **membranous croup** its use is an excellent auxiliary to the treatment, but it is not to be depended upon alone. It may be given in small doses, not sufficient to produce emesis, until the membrane is separated, then the dose may be increased until the membrane is removed.

It is an excellent remedy in **atonic conditions** of the lungs or bronchi with imperfect circulation and relaxed mucous membranes, with general inactivity of the nervous system and lack of nerve force. It should not be prescribed during active inflammation, but will be of service when the more acute symptoms have abated.

It will assist in overcoming **hepatization** of lung structure and restoring normal tone and normal functional action. The powdered drug in small doses in a capsule, may be combined with hydrastis or quinia with excellent effect when those agents are indicated as restoratives.

It is said to act upon the stomach, liver and portal circulation, as a stimulant, and to the glandular organs and structures of the intestinal canal, and to exercise an alterative influence within the blood.

The tincture in full doses, is an **emmenagogue**, restoring the menses when suppressed from cold. It is not to be given if menstrual deficiency is due to anæmia, although it is tonic and stimulant in its influence upon the reproductive organs.

The powdered Sanguinaria is applicable to suppurative conditions. It is useful in **otitis media** and in **ozæna**.

The nitrate of Sanguinaria is a soluble salt, as useful and less irritating than other forms of Sanguinaria. It is valuable as a local application to **indolent ulcerative conditions**. It should be used in small quantity in ointments, or in solution as a lotion. It is serviceable in chronic **nasal catarrh**, in chronic ulcerations of the throat, and in **fissures** and ulcerations of the **anus**. It will act in this concentrated form as an escharotic, and is of much service as an application to **epithelioma**, **lupus** and to other growths of a similar nature.

IPECAC.

CEPHALIS IPECACUANHA.

Synonym—Ipecacuanha.

Part Employed—The root.

Natural Order—Rubiaceæ.

Locality—Brazil, Bolivia, New Granada.

Botanical Description, (J. U. Lloyd, Western Drug.)—The stem of this plant is simple, short, shrubby, seldom over two feet high, bearing opposite leaves above, usually naked below. The roots are numerous, branched and covered with a thick, ringed bark, which is characteristic of the drug. The leaves are opposite, petiolated, entire, smooth, dark-green, and usually crowded near the top of the plant. At the base of each pair of leaf stalks there is a pair of whitish, laciniate, cut stipules, similar to the stipules which we find in several of the rubiaceæ of this country. The flowers are small, white, funnel-

shape and collected in a terminal head (whence the generic name of the plant), which is enclosed in four large ovate bracts. The stamens and pistils are dimorphous; that is, some flowers bear long stamens and short pistils, and conversely, other flowers short stamens and long pistils.

CONSTITUENTS—Emetine, the emetic principle existing in the stem, leaves and root, cholin and cephaeline in the root, ipecacuanhic acid, and a nauseating ethereal oil.

PREPARATIONS—Extractum Ipecac Fluidum, Fluid Extract of Ipecac; dose, from one to forty minims.

Syrupus Ipecac, Syrup of Ipecac; dose, from ten to sixty minims.

Pulv. Ipecac et Opii, Powder of Ipecac and Opium, composed of Ipecac and opium of each ten parts, Sugar of Milk eighty parts; dose, from three to ten grains.

Specific Ipecac; dose, to relieve gastric, intestinal or bronchial irritation, five drops in four ounces of water; a teaspoonful every hour. As an emetic, from five to twenty minims in hot water.

Physiological Action, (J. U. Lloyd, Western Drug.)—Ipecacuanha root, from its first appearance in our materia medica, has been prized as an emetic and antidyenteric remedy.

In recent years a preparation of ipecacuanha has appeared on the market which is free from emetine, and is commended in cases of acute dysentery, whereby the symptoms of nausea produced by emetine are claimed to be obviated. We have no authoritative evidence, however, to support the claims that have been made for this de-emetinized Ipecac.

The peculiar effect that the dust of ipecacuanha powder exerts upon the respiratory organs of some persons has been noted by early observers. Lewis, in 1761, makes the following statement: "Geoffroy observed that in pulverizing considerable quantities, the finer powder that flies off, unless great care be taken to avoid it, is apt to afflict the operator with difficulty of breathing, spitting of blood, and bleeding at the nose, or swelling and inflammation of the eyes and face, and sometimes of the throat, adding that these symptoms disappear in a few days, either spontaneously or by the assistance of venesection." Kunze (1830) reports a case of poisoning in this manner which was treated by blood-letting and the taking of a decoction of uva ursi and extract of rhatany; in another more recent instance, relief was afforded by a dose of extract of quebracho.

Powdered Ipecac applied to the skin produces irritation and redness, followed finally by small isolated pustules, which increase in size to small ulcers.

The powdered ipecac in one-sixth of a grain doses is a stomachic tonic, stimulating the salivary and gastric secretions. In doses of ten grains it will act as a nauseating emetic, but the

emesis occurs slowly and is not extreme, persistent nor prostrating like that of lobelia or tartar emetic.

In some cases continued repetition of the emetic dose produces a toleration, when the emetic effect ceases, but there is diarrhœa—an active cathartic influence, with stools characteristic of this agent. In some children the persistent use of the syrup of Ipecac will invariably produce diarrhœa, often persistent and difficult to cure.

The agent is also diaphoretic and actively expectorant.

Specific Symptomatology—Persistent irritation in mucous membranes, with deficient secretion, demand Ipecac in small doses.

Persistent nausea and vomiting, with pale, relaxed membranes, white-coated, broad tongue, will often yield most readily to minute doses ($1/10$ of a drop) frequently repeated.

Bronchial gastric or intestinal irritation are benefited by its use.

It is indicated also in croup, with sudden dyspnœa and threatening suffocation, extreme secretion, without ability to dislodge. A half teaspoonful of the syrup will sometimes give immediate relief.

In extreme inactive conditions of the stomach and bowels, with or without pain—the inactivity shown by a broad, pallid tongue, covered very thickly with a dirty white coat, which finally becomes sleek on the top, increasing from tip to base in dirtiness, to a brown color; full emetic doses of Ipecac persisted in for a short time will quickly correct almost the entire train of symptoms.

Therapy—For its full emetic influence Ipecac is probably the most satisfactory of the emetics. When there is **undigested food** in the stomach, causing irritation, when mild poisons are taken, when emesis is demanded to relieve **sick headache**, this agent is used in preference to others. If promptness of action is demanded the full dose should be given in a bowl of warm water—not hot—or a single full dose of lobelia may be given with it. This produces immediate emesis without prostration. If powerful **poisons** are taken, and active emesis is demanded, the sulphate of zinc or lobelia in persistent doses, or some other emetic more immediate in its influence, is usually used, although the writer has always been able to adjust Ipecac with such adjuvants as warm water, mustard, or tickling of the throat, to every case. In cases where **foreign bodies** are **lodged** in the **œsophagus**, and in threatened suffocation in **mucous croup**, or in **membranous croup**, Ipecac is the remedy, especially in childhood. No emetic more harsh should be used with children. In the developing stage of **malarial fevers** it was once the practice to produce active diaphoresis by a hot pediluvium and hot drinks, the patient being wrapped in warm blankets, and to

produce profound emesis with Ipecac. Often the most desirable results were obtained, and in some cases where an acute cold had been contracted, or where there was a severe chill, in strong, previously healthy patients, the disease was suddenly terminated by this course. The author has had this experience. In the **bronchitis** of childhood occurring often suddenly, with a dry, hoarse, stridulous or croupal cough, without secretion, ten drops of the syrup of Ipecac given every half hour, hour, or two hours until nausea is induced, will sometimes abort the condition in a few hours, the influence of the agent dispelling the conditions essential to the progress of the disease. This form of bronchitis is common in furnace-heated houses, and in close, hot, unventilated apartments, in the beginning of the winter when the furnace fire is first started, and in the spring.

Ipecac in small doses given in conjunction or in alternation with aconite or bryonia or belladonna, is of great service in **pneumonia**, especially that of childhood. Five drops in a half glass of water, a teaspoonful every hour, may be given with the best of results. In **acute bronchitis** it may be prescribed in the same manner.

Ipecac is of value also in the after stages of **pneumonia**. In the stage of active inflammation it is useful as stated, but is not given in the same form as in the latter stages. It is an excellent remedy to assist in clearing up **hepatization**, and in restoring normal conditions in the lung cells. The author, when the temperature has subsided, gives one-fourth to one-half a grain of powdered Ipecac to an adult, every two or three hours in a capsule, with two grains of the bisulphate of quinine. The tonic influence of the quinine assists the influence of the Ipecac.

Ipecac is of value in **coughs** when there is deficient secretion, whatever the cause. Emetic doses are not desirable if the agent is to be continued for a length of time.

It has been beneficial in **spasmodic asthma**, **whooping cough** and in **laryngismus** stridulus.

This agent is advised in irritation of the bowels resulting in acute inflammation. In small doses it is given with good results in cholera infantum and in diarrhœas, but is of no benefit beyond the acute stage. In **dysentery** it is of much service. The early writers advised it in large doses of the powder. In sthenic cases this method is serviceable, but in children and in asthenic cases it should be given in small, frequently repeated doses, with aconite if indicated.

If the **dysenteric tenesmus** is relieved with prompt doses of gelsemium—and we have a no more efficient remedy in the materia medica for this condition than that agent—the beneficial effects of the Ipecac upon the local inflammatory processes will be more plainly marked.

In **hemorrhages** Ipecac has exercised a satisfactory influence. Its influence upon the circulation is quite prompt. It is given by some physicians in small doses for this purpose, and by others in full doses to prompt emesis. It has controlled post-partum hemorrhage, menorrhagia, metrorrhagia, epistaxis and hæmoptysis, and will exercise a beneficial influence in hæmaturia.

SCILLA.

SCILLA MARITIMA.

Synonym—Squill.

Part Employed—The bulb deprived of the outer scales and central portion.

Natural Order—Liliaceæ.

Locality—The Mediterranean basin.

Botanical Description—A perennial herb, with a pear-shaped bulb, composed of fleshy imbricated scales, weighing about four pounds, pale-green or red, giving off fibrous roots from the base; leaves, which appear long after the flowers, lanceolate, pointed, deep green, shining, one and a half to two feet long, channeled, spreading; flowers whitish, three-fourths of an inch in diameter, on a scape three feet high, terminating in a dense raceme collection. The bulb is gathered in August, freed from the outer and inert scales, and the inner portion, which is too mucilaginous, cut into transverse segments and dried in the sun. As found in the market it is in slices about one-fourth of an inch wide and one to two inches long, yellowish-white and usually flexible, but when perfectly dry, brittle; taste bitter, acrid. Solvents, alcohol, water, vinegar. Dose, from five to ten grains.

CONSTITUENTS—Scillitin, skalein, calcium oxalate, sinestrin, scillipicrin, scillitoxin, scillin.

PREPARATIONS—Acetum Scillæ, Vinegar of Squills. Dose, from five to thirty minims.

Extractum Scillæ Fluidum, Fluid Extract of Squills. Dose, from one to five minims.

Syrupus Scillæ, Syrup of Squills. Dose, from half an ounce to two ounces.

This agent is best known for its action upon the mucous membrane of the respiratory tract. It increases expectoration and is actively nauseating.

For this effect it is given in severe **bronchial coughs** without secretion, in dry, harsh **irritating coughs**, the sputum scanty and tenacious. It has a soothing influence over bronchial irritation.

Squill is an active **diuretic**. Given in non inflammatory conditions, where there is lack of tone, relaxation of the mucous

membrane, with debility, it stimulates the entire urinary structures. It has long been given in dropsy for the removal of the fluid, its action being prompt and efficient, partly because it stimulates the action of the heart, improves the circulation and strengthens the pulse.

It may be given in conjunction with apocynum, digitalis or cratægus, with all of which it acts harmoniously in these cases.

ANTIMONY AND POTASSIUM TARTRATE.

Synonyms—Tartarized or Tartrated Antimony, Tartar Emetic.

Occurrence—Formed from the acid tartrate of potassium and the oxide of Antimony, in distilled water.

Description—It occurs in rhombic crystals, colorless and transparent when newly crystallized, but opaque and white upon standing. At other times in the form of a white granular powder from the disintegration of the crystals. It has a taste at first sweet, afterwards disagreeable, nauseous, astringent and metallic; odorless; soluble in seventeen parts of cold water and in three parts of boiling water, in alcohol and ether.

Administration—Its solutions are incompatible with acids and alkalis.

The dose of this salt is from $1/20$ to two grains, in free solution.

Physiological Action—It increases secretion from all the glands of the mouth and intestinal canal, and subsequently of the larger glandular organs. It produces irritation of the fauces, and the irritation is continued down the esophagus into the stomach. It is profoundly irritating to the stomach and bowels. The first emesis is produced by its local influence upon the nerves distributed to the mucous membranes in the stomach. The subsequent persistent and extreme nausea is induced by the influence of this agent upon the vomiting center of the brain after absorption. This produces intense depression of the nervous system amounting in extreme cases to paralysis. The depression involves the muscular system, the heart and the circulatory system and the respiration.

The skin is cold and covered with a profuse sweat, and there is greatly increased secretion from all mucous surfaces. Hare says the patient is drowned in his own secretions. In physiological doses our physicians have almost entirely discarded this remedy. Its action is too harsh. In every condition for which it is so prescribed we have a remedy equally efficient, much milder and in every way controllable in its action.

Therapy—In exceedingly minute doses, triturated with sugar

of milk, homœopathic physicians advise it as a specific agent in **capillary bronchitis**. It is given where there is a lack of ability to expectorate **thick** and **tenacious mucus**, where the **breathing** is of a **wheezing** character, there is a rattling cough and feeble pulse. This condition is found in some cases of **croup**, **asthma** and **pneumonia**, as well as **bronchitis**. We have remedies specific to these conditions that are not homœopathic in character.

Because of the depressing character of Tartar Emetic it was at one time advised in all acute inflammations as an antiphlogistic. It is now practically abandoned in therapeutics, except as a constituent of the compound syrup of squills, which is an official syrup in common use in the treatment of croup and croupal coughs as an expectorant.

GRINDELIA ROBUSTA.

Synonyms—Wild Sunflower, Gum plant.

Part Employed—The leaves and flowering tops.

Natural Order—Compositæ.

Locality—California and the western coast of the United States.

PREPARATIONS—Fluid Extract of the leaves and flowering tops. Dose, $1/2$ to 1 fluid dram. Solid Extract. Dose, 5 to 15 grains.

Specific Grindelia—Dose, from two to ten drops.

CONSTITUENTS—A resin appears on the involucre early in the growth of the plant, which is afterward found in the leaves, which with a volatile oil, contains the larger portion of the medicinal properties of the plant. The resin is slowly soluble in water and freely soluble in ether and alcohol. There are medicinal properties, however, which alcohol does not dissolve—an aqueous solution rendered alkaline extracts the larger portion of the medicinal properties.

Botanical Description—It is a perennial plant with a single stem during the first year, which dies in the fall. Subsequently from two to ten stems are evolved as the root attains age, these stems becoming more or less shrubby. About the first of May its spherical involucre appear on a branched stem, and they are soon covered with a milk-white resinous exudation. The flower begins to expand a few weeks later, when they exhibit hemispherical heads with yellow florets, not unlike a small sunflower. It grows on salt water marshes and in swampy inland localities. The leaves are from one to two inches long, smooth, oblong, obtuse, coarsely serrate, clasping the stem. The stem of the latter is hairy, leaves oblong, somewhat pubescent and sharply serrated.

Physiological Action—The influence of the agent is exhibited on the heart, at first by a quickened pulse, subsequently by retarding it. It elevates the blood pressure at first, subsequently lowering it. In overdoses it is toxic, the specific influence of the agent on the respiratory nerves being shown by paralysis of the muscles of respiration.

Specific Symptomatology—The agent is specific to **asthmatic breathing**. It must be given in full and frequent doses, and the effects, although not striking from a single dose, are soon evident and are more or less permanent. It soon relieves the effort of breathing and produces expectoration, but on continued use the entire train of symptoms slowly abate, and if persisted in the paroxysms do not soon recur.

It may be combined with good results with lobelia, stramonium, drosera, or ipecac, and in some cases for continued use, small doses of the iodide of potassium will act nicely with it.

Therapy—Grindelia is more permanent in its influence on chronic asthmatic breathing than any of our other agents. In spasmodic asthma, pure and simple, with complete relief between attacks, it is not the remedy. It is an excellent antispasmodic expectorant in all chronic spasmodic **bronchial coughs**, and in chronic bronchitis. Asthmatic bronchitis is often benefited, from the first dose, by its use. In whooping cough it is of value in combination with other more specific agents.

It will relieve the **irregular heart** action, often accompanying chronic coughs, and improve the strength and general character of that organ.

Grindelia has relieved very many cases of **hay fever** and has cured some few, for the time being. In the chronic cough following pneumonia the agent has been used with good results.

As an application to the skin when poisoned by rhus toxicodendron, this agent is most valuable. It acts promptly and satisfactorily.

It is curative also in the bites of insects, quickly antidoting the poison.

As applied to old indolent ulcers it has given unusual satisfaction in a few cases, although not often used.

QUEBRACHO.

ASPIDOSPERMA QUEBRACHO.

Synonym—Quebracho Blanco.

Part Employed—The bark.

Natural Order—Apocynaceæ.

Locality—Brazil, Argentine Republic and other parts of South America.

CONSTITUENTS—The bark of Quebracho contains at least six alkaloids. Aspidospermine, which is thought to be one of these, is not a single alkaloid, but represents the full activity of the drug; dose, $\frac{1}{4}$ to $\frac{1}{2}$ grain.

PREPARATIONS—Fluid Extract Quebracho, not miscible with water; dose, fifteen minims to one fluid drachm. Solid Extract Quebracho; one part equals ten of drug; dose, one to three grains.

Botanical Description—Quebracho is a magnificent South American evergreen tree, exceedingly tall, growing to the height, in the tropical portions, of 100 feet; erect, with wide spreading crown which overtops all the surrounding undergrowth and smaller trees. The upper branches are erect, the middle ones horizontal and the lower ones drooping, and with a greater abundance of leaves than those above. The leaves are of a light shiny green color.

Physiological Action—In investigating the physiological action of this agent, Penzoldt determined that its influence was exerted upon the heart and respiratory functions. He found in different forms of dyspnoea—from emphysema severe bronchitis, phthisis, chronic pneumonic processes, with periodic asthma and pleuritis, that after giving one to two teaspoonful doses of a solution sometimes two or three times a day, the frequency of breathing generally diminished, the respirations were less deep, and that the cyanosis especially, in phthisis and emphysema, was almost invariably diminished or removed. The effects lasted for hours and were followed, without exception, by improvement of the patient. In one case of inherited pulmonary stenosis, and in another of thrombosis of the left main branch of the pulmonary artery, the effect was remarkable, though but temporary.

Mariasi y Larrion, of Madrid, employed Quebracho in a number of diseases of the respiratory and circulatory organs. The following conclusions are a short resume of his observations from a paper translated for the Therapeutic Gazette in 1880:

“The principal action of this drug is to cause a diminution of the number of pulse beats per minute, and lessen the frequency of the respiratory act.

“Its principal and direct action is on the circulatory center, giving tone and regularity to the contractions of the heart, with an intermediate effect on the nervous system.”

Specific Symptomatology—Quebracho acts specifically in **difficult breathing—dyspnoea**, as occurring in many forms of heart disease, or in asthma of whatever character. It is also beneficial in the complications and sequelæ of pneumonitis, pleuritis and bronchitis, in emphysema and in phthisis pulmonalis, where the breathing is in any way impeded, and in diseases of the thoracic organs, of this character, due to malaria.

It is not employed with such good effects in nervous dyspnœa.

Its action is rapid, and is manifested almost immediately after the administration of the medicament.

Its administration in the doses indicated is not dangerous, and its continuation will not have any undesirable influence on other organs.

Therapy—In **thrombosis** of the pulmonary artery, in some cases of **apoplexy**, and in **uremic dyspnœa**, it has been of great service. Those of our own physicians who have used it wherever there is difficulty in breathing are enthusiastic in praise of the relief it gives. It overcomes some of the severest cases of cyanosis, and although its influence is not always permanent, it often prolongs life and the relief is most grateful to the patient. Hale calls it the digitalis of the lungs and lauds it for its influence on difficult breathing without much distinction as to the cause.

It undoubtedly removes temporary obstruction to the oxidation of the blood, and by stimulating the respiratory centers it increases oxidation, and facilitates the excretion of carbonic acid.

The agent has quite a positive influence in malarial fevers with or without lung complications, acting as a sedative, anti-periodic and febrifuge. It is not widely used for this purpose, and it does not influence other fevers.

EVENING PRIMROSE.

ŒNOTHERA BIENNIS, LIN.

Synonyms—Cure all, Tree Primrose.

Part Employed—Leaves, twigs and bark.

Natural Order—Onagraceæ.

Locality—United States.

PREPARATIONS—Extractum Œnotheræ Fluidum, Fluid Extract Evening Primrose; miscible with water; dose, ten minims to one fluid dram. In some cases small doses of from ten to twenty drops often repeated act the best; in other cases from twenty to forty drops at a dose will be found necessary. It is non-toxic and non-irritating.

Botanical Description—A biennial herb with stout, erect, simple, usually hirsute stem; leaves lanceolate to the ovate-lanceolate, repandly denticulate, $\frac{2}{6}$ inch long, acute or acuminate, more or less pubescent; flowers erect in the bud, nocturnal, yellow, sometimes odorous, in a terminal, somewhat leafy spike; seeds very numerous and arranged in two rows in each cell, nearly horizontal or ascending.

Specific Symptomatology—Specific in nervous and irritable patients, to the **difficult breathing**, general respiratory distress,

and to the long train of **gastric** symptoms accompanying **chronic asthmatic disorder**—in the **chronic indigestion** and **gastric irritability** of **confirmed asthmatics** and also in those cases, of a nervous type, where gastric disorder and irritability usually develop cough, dyspnœa or palpitation.

Therapy—The agent is mildly antispasmodic, probably influencing the spinal accessory and pneumogastric nerves. It is beneficial in **whooping-cough** with nervous and gastric complications. It is sedative to the nervous system, and to mucous membranes when irritated from an irritable nervous system. It cures the cough and the gastric irritation and vesical irritation, with frequent urination in **hysterical** females, and ameliorates hysterical attacks. A case of **violent dysentery**, with severe tenesmus and bloody mucus discharges following typhoid was relieved by a single dose of twenty-five drops and cured within a very short time. It will probably prevent **ulceration** in some cases of **typhoid fever**.

VASICA.

ADHATODA VASICA.

This agent, native to Bengal, is in use in Europe, and although not known to American physicians, is referred to here because of its reputed reliable properties.

Therapy—The leaves are smoked as a remedy for **asthma**.

It is an expectorant, antispasmodic, and is also employed in **consumption, chronic bronchitis** and other pulmonary and catarrhal affections.

The agent has the peculiar property of destroying animalculæ in water, and a solution of the active principle—vasicine—destroys all small animals in ponds—frogs, leeches and other water animals, as well as mosquitoes, fleas, centipedes and many other insects, also noxious water plants.

CHAPTER II.

Agents Acting Upon the Mucous and Serous Structures of the Respiratory Tract.

STICTA.

DROSER.

MOMORDICA.

ASCLEPIAS.

EUPHRASIA.

POTASSIUM BICHROMATE.

STICTA.**STICTA PULMONARIA.****Synonym**—Lungwort.**Part Employed**—The lichen.**Natural Order**—Lichenes Parmeliaceæ.**Locality**—United States.

Botanical Description—This lichen is found growing on rocks and trunks of old trees in New England, New York and Pennsylvania; thallus somewhat leathery and cartilaginous, foliaceous, lacunose, lax, reticulate, dark-green and olive-colored on the upper side, wooly beneath, with naked white spots, lobes elongated, separate, sinuate, retuse, truncate; apothecia submarginal, circular, thickish, reddish, adhering closely to the thallus to which they are attached by the center, while they are otherwise free; gemmiparous plates flat, forming disks, encircled by borders of the thallus, which projects beyond them. Solvent, alcohol; dose, from one to five grains.

CONSTITUENTS—Not analyzed.

PREPARATIONS—Specific Sticta; dose, from one-tenth to ten minims.

Specific Symptomatology—This agent acts directly upon irritation in the chest, especially when complicated with irritation of the nerve centers.

Pain beneath the scapulæ extending to the occiput, sharp pain with soreness above the scapulæ, or in the shoulders, especially indicate Sticta.

Therapy—It relieves irritable **cough** of a short, hacking character, especially prevalent in the early part of the year. In coughs of acute bronchitis, with the indications named, it is useful; in cough, with wheezing and tightness—**asthmatic cough**, with the characteristic quick sharp pains, it is indicated. It also influences directly the post-nasal mucosa.

It is valuable in some forms of **catarrh**, especially if there is reflex irritation. It has been used in **whooping-cough** and in **croupal coughs**.

Sticta has been suggested in **rheumatism** where the muscles of the chest are involved, where there is sharp, quick pain on respiration or where the muscles of the shoulder are sore and tender, where the muscles of the neck are involved.

The remedy has been used in **scarlet fever** to good advantage, but we have no specific directions for its administration in these cases beyond those named.

It is specific in the treatment of **hay fever** and in those attacks of **influenza** characterized by the discharge of a hot, irritating, watery mucus, which afterwards becomes thick, bloody, greenish or yellow.

The catarrhal disorders to which this remedy is applicable are characterized by headache, with tearing pains through the side of the face and lower jaw, with pressure in the forehead at the root of the nose, sneezing, coryza, conjunctivitis, soreness and dull pains in the chest.

ASCLEPIAS.

ASCLEPIAS TUBEROSA.

Synonym—Pleurisy Root.

Part Employed—The root.

Natural Order—Asclepiadeæ.

Locality—United States.

Botanical Description—*Asclepias Tuberosa* is a perennial plant, growing in sandy fields and flowering in June and July; stem weak, branching, hirsute, three feet high, erect or recumbent, round, green or reddish color; leaves undulate, lower with short foot-stalks, upper sessile, deep green above, paler beneath, very hairy; flowers orange-red, arranged in terminal corymbose umbels; root large, fleshy, fusiform, white, branching, and is found in the market cut in pieces one to six inches long, one inch thick; head knotty, annulate, the remainder longitudinally wrinkled externally, yellowish-brown, internally whitish, becomes gray throughout by age, tough, fracture uneven, bark thin, in two layers—outer brownish and inner white, wood with large white medullary rays. It is inodorous and has a bitterish, somewhat acrid taste—(U. S.) Solvent: Dilute alcohol, boiling water. Dose, from fifteen to sixty grains.

CONSTITUENTS—Glucoside, tannic and gallic acids, resin, fixed oil, volatile oil, fat, gum, starch.

PREPARATIONS—*Extractum Asclepiadis Fluidum*, Fluid Extract of *Asclepias*. Dose, from one to five grains. Specific *Asclepias*. Dose, from one to sixty minims.

Action—Diaphoretic, expectorant, cathartic, tonic.

Physiological Action—In regard to the action of *Asclepias*, Grover Coe, M. D., writing in 1858, gives the following wide range of action. He says: "No other remedy with which we are acquainted is so universally admissible in the treatment of disease, either alone or in combination. In fact we think of no pathological condition that would be aggravated by its employment. It expels wind, relieves pain, relaxes spasm, induces and promotes perspiration, equalizes the circulation, harmonizes the action of the nervous system, and accomplishes its work

without excitement; neither increasing the force or frequency of the pulse, nor raising the temperature of the body. It is of special service in the treatment of affections involving the serous membranes, as pleuritis, peritonitis, etc."

The above writer recommends Asclepias for the following long catalogue of diseases: fevers of every type, pneumonia, croup, peritonitis, pleuritis, rheumatism, colics, colds, coughs, hepatic derangements, constipation, whooping-cough, hysteria, amenorrhœa, dysmenorrhœa, leucorrhœa, menorrhagia, and inflammatory diseases of every type. It is a most valuable remedy in the advanced stage of phthisis pulmonalis."

It is perhaps the enthusiasm of some of the old writers on Galenicals, making a panacea out of a single remedy, and not defining its more direct central or specific properties, that has caused the general profession to regard some of them with incredulity.

The most active apparent influence of this agent is upon the sudoriparous glands. It is distinctively an eliminative agent of general utility. It is mild in its influence, but if given with confidence it will produce good results.

Specific Symptomatology—Its first direct effect is upon the thoracic organs. It is specific to **pleuritic pains**, both of the acute, and subacute variety, in doses of fifteen drops every two or three hours. The writer prescribes this agent with positiveness, and has yet to be disappointed. If effusion is present its rapid removal is facilitated. The pain and distress abate, the cough disappears, the respiration becomes free and natural, the inspiration being especially pleasant; the heart takes on increased tone, and the entire contents of the thoracic cavity seems benefited. He has treated with this remedy the "stitch in the side," which had been present for many months after pleurisy, and has removed it satisfactorily.

This agent will cure **pains** in the **chest** unaccompanied by prominent symptoms, acute, sharp and cutting, recurrent or persistent in their character, if given in doses of half a dram every two or three hours and persisted in for a few days.

Therapy—It is beneficial in acute **pleuritis** specifically, also in **bronchitis**, **pneumonitis** and **peritonitis**. It has distinct expectorant properties. In tight and painful coughs with difficult respiration, especially where there is a general suspension of secretion, with dry skin and mucous membranes, and in soreness of the chest from coughing, it is a most excellent remedy. In all these conditions if there is the least elevation of temperature its influence will be greatly enhanced if given in conjunction with aconite.

It was in great repute among the older Eclectic physicians in the treatment of **acute pleuritis**, as suggested above. They also used it in acute inflammations of serous membranes, especi-

ally if there were acute, quick pains, and a tendency to serous effusion. Its eliminative action upon the skin greatly enhances its influence in these cases.

If the powdered *Asclepias* be combined with ipecac and camphor, a powder is produced with diaphoretic properties greater than those of Dover's powder, with all the sedative and anodyne properties of the latter.

To obtain active diaphoresis, *Asclepias* should be given in strong, hot infusion. Its influence in **acute rheumatism** should not be overlooked. It may be combined with such agents as *cimicifuga* and *colchicum*, and will markedly intensify their action, especially if *aconite* is indicated.

In full and continued doses it is a sedative to stomach pains, relieves flatulence and is mildly cathartic. It is of value in the catarrhal diarrhœas of childhood and in catarrhal dysentery. It soothes the entire intestinal mucous tract.

DROSERA.

DROSERA ROTUNDIFOLIA.

Synonyms—Sundew, Youthwort, Lustwort.

Part Employed—The fresh plant.

Natural Order—*Droseraceæ*.

Locality—United States and Europe.

Botanical Description—*Drosera Rotundifolia* is a small perennial aquatic plant, growing in peat bogs and in swamps and flowering in July and August; leaves radical, petiolate, small, nearly orbicular, fleshy, covered on the upper side with glandular bristles, purplish at the margin and whitish towards the center; they secrete a clammy fluid, which appears like a dewdrop glistening in the sun; scape four inches high, circinate, bearing a simple, one-sided raceme of small white flowers; petals five; stamens five; and styles three; ovary single; capsule three to five-valved, many-seeded; seeds spindle-shaped, coat loose and chaff-like; taste bitter, acrid, acidulous. Solvent, alcohol; dose, one-half grain.

CONSTITUENTS—An acrid resin, citric acid, red coloring matter, glucose.

PREPARATIONS—Fluid Extract Sundew; not miscible with water; dose, five to twenty minims.

Specific *Drosera*, two to five minims. An excellent and potent preparation.

German Tincture Sundew; an imported preparation, from the green plant; dose, fifteen to sixty minims.

Specific Symptomatology—The field of the influence of this remedy is narrow. It is specific to dry, irritable, persistent cough; also cough of a hoarse, resonant, explosive, or spasmodic character, without secretion.

Therapy—It is an antispasmodic, expectorant, and sedative

as applied to such coughs. It will also relieve coughs of sympathetic origin, and so-called nervous coughs. It will cure the **cough of measles** more quickly than other remedies, and it will cure the after cough of **whooping-cough**. It will terminate a whooping-cough and leave the patient free from cough, when the active stage of the disease has passed. If there is a deficiency of bronchial secretion it will be found of great service during the progress of whooping-cough, greatly modifying the paroxysms of the disease; the paroxysms occurring less often.

It is serviceable in all chronic coughs of a dry, irritating character, especially if the central nervous system is irritated. It is of service in **chronic bronchitis**, and in **phthisis pulmonalis**.

It has also relieved **asthmatic coughs**, with nervous irritability. It has been used in a few cases as a sedative and tonic in irritable conditions of the **stomach**, relieving **flatulence** and curing mild cases of **gastric ulcer**.

EUPHRASIA.

EUPHRASIA OFFICINALIS.

Synonym—Eyebright.

Part Employed—The herb.

Natural Order—Scrophulariaceæ.

Locality—Europe, North America.

Botanical Description—*Euphrasia Officinalis* is an annual plant, six inches high, flowering in July; stem square, leafy, downy, simple or branched; leaves opposite, shortly petiolate or sessile, oval or lanceolate, strongly ribbed and furrowed, one-third inch long, with four or five teeth on each side; flowers axillary, solitary, abundant, inodorous; corolla white or lilac, two-lipped, with yellow throat; calyx bell-shaped; four-cleft; stamens four; anthers violet; pods oblong, seeds numerous, oblong, grooved lengthwise. Solvent, alcohol, water; dose, ten grains.

CONSTITUENTS—Volatile oil, an acrid, bitter principle, mannite, tannin.

PREPARATIONS—Specific *Euphrasia*; dose, from one to sixty minims.

Specific Symptomatology—The sphere of action of this agent is upon irritating and catarrhal disease, first; of the upper portion of the respiratory tract, and afterward of the mucous structures of the throat and bronchial tubes. It is more immediately beneficial if the discharge is thin and watery—fluent.

Therapy—In **acute coryza** the agent exercises a specific action. It should be given in ten drop doses of the tincture every hour or two. In “snuffles,” so called, in very young infants, five drops of the tincture may be dropped into half of a

glass of water, and a teaspoonful given every ten, fifteen or thirty minutes. Relief is often immediate. In the **coryza** of **measles** it is of much benefit, and the bronchial and pulmonary irritation caused by this disease is ameliorated also by its use.

Its influence is quickly observed upon the membranes of the eye and upon the lachrymal structures. The unpleasant after influence of measles upon the eyes, is quickly relieved by the use of Euphrasia. Its internal use will benefit many cases of conjunctivitis, especially those cases of recent origin, in children.

MOMORDICA.

MOMORDICA BALSAMINA.

Synonym—Wonder Apple.

Part Employed—The fruit.

Natural Order—Cucurbitaceæ.

Location—Tropics and sub-tropics.

PREPARATIONS—Fluid Extract; dose, one-half to two fluid drams. Tincture, one to two fluid drams.

Botanical Description—*Momordica Balsamina* is a climbing plant indigenous to the tropical countries of the old world; introduced into the new world by African negroes.

Therapy—It is useful in acute **pulmonary congestion**, and distress in the chest from **acute colds**. In general **muscular soreness** its influence resembles that of *cimicifuga*.

It will probably be found useful to promote healing after severe injury, as it also closely resembles *arnica* in its sphere of action. It is of much value externally in **burns, cuts, bruises, abrasions, contusions and lacerations**, infiltrations, chilblains and also in hemorrhoids. It is used by natives in **dropsy** as a **hydragogue cathartic**. It also acts as an emetic in sufficient doses. It is stimulant and soothing to irritable mucous membranes, and is used in distress in the stomach and bowels, and in **acute colic**.

POTASSIUM BICHROMATE.

Formula— $K_2Cr_2O_7$.

Synonym—Bichromate of Potassium.

Description—This is prepared by the action of sulphuric acid upon the yellow Potassium chromate. It forms transparent prisms of an orange-red color, odorless, with a bitter metallic taste. The crystals are permanent in the air, soluble in one and one-half parts of boiling water, and in ten parts of cold water. It is insoluble in alcohol.

Physiological Action—In physiological doses the agent is not used internally. It is an irritant and caustic, producing

disintegration of tissue and sloughing. In the stomach it produces symptoms of acute gastro-enteritis, with feeble, irregular heart action, coma and death. In large doses its effects are immediately violent.

Therapy—Triturated with sugar of milk this agent is of much service in some cases of bronchitis. One one-hundredth of a grain of the salt so triturated will relieve dry, irritable bronchial coughs and produce amelioration of symptoms in some stubborn cases.

It is useful in **hoarseness** from a cold, with the accompanying dry, hard, irritating cough. Harsh, rasping **cough** in the **upper air tubes** is influenced by its persistent use.

CHAPTER III.

Agents Acting Upon the Mucous Structure of the Respiratory Tract.

TURPENTINE.

BENZOIN.

ACETIC ACID.

TEREBENE.

AMMONIUM CHLORIDE.

ETHYL IODIDE.

TURPENTINE.

OLEUM TEREBINTHINÆ.

Occurrence—Turpentine is obtained from the *Pinus Palustris* and from other species of the pine in the form of an **oleoresin**.

Synonyms—Long-leaved Georgia, Swamp, or Pitch Pine.

Part Employed—Oleoresin.

Natural Order—Coniferæ.

Locality—Northern, Eastern and Southern United States.

Botanical Description—A stately evergreen tree from fifty to one hundred feet high, with pyramidal shaped top formed by horizontal branches, decreasing uniformly in length from the lower to the topmost branches; bark thin, furrowed and scaled; wood resinous, hard only when more completely saturated with resin; leaves in groups of three, linear, glaucous, very narrow, flat, sharp-pointed; cones five to ten inches long, cylindrical, erect, reflexed; scales broad and compact, armed with an acute spine.

The **crude Turpentine** exudes spontaneously from the trees, but to obtain a full quantity the trees are cut into, or "boxed." Cavities which will hold more than a quart of the sap are excavated in the tree downward. Into these the sap flows and is dipped out. It flows from March to October, most abundantly in July and August. This **oleoresin** when hardened occurs in tough yellowish masses, brittle and pulverizable when cold, with the characteristic odor and taste of Turpentine; soluble in alcohol.

The oleoresin is distilled, and the product is the **Oil of Turpentine** or the **Spirits of Turpentine**. The residue is **Resin** (colophony).

Description—The oil is a thin, neutral, colorless liquid, with a specific gravity of 0.87, soluble in three volumes of alcohol. It boils at about 330 deg. Fah.

PREPARATIONS—The oil distilled with six volumes of lime-water, produces the **Rectified oil of Turpentine** (*Oleum Terebinthinæ Rectificatum*). This is the form which should always be used in medicine. Dose, from two to twenty minims.

Terpene hydrate is formed by the action of nitric acid upon the rectified oil of turpentine, and alcohol. The product is distilled; crystalline, colorless, nearly odorless; slightly soluble in water, soluble in alcohol; dose, from one to three grains.

Terebene is obtained by the action of sulphuric acid on the rectified oil. The product is distilled; a colorless, thin, aromatic liquid. Soluble in alcohol, slightly so in water; dose, from three to fifteen minims.

Physiological Action—The oil of Turpentine is an irritant when applied to the skin or mucous membranes in any considerable quantity. It causes burning, a vesicular eruption, and deep, stubborn ulcerations. In the stomach it produces warmth, increased from an overdose to a burning pain, nausea, vomiting, purging, eructations of the oil, great gastro-intestinal irritation, amounting to gastro-enteritis. In toxic doses it causes renal hyperæmia, great irritation of the urinary tract, violent hæmaturia and strangury, with suppression of urine and albuminuria.

It stimulates the heart, increases the arterial tension for a time, increases the temperature and exalts the mental faculties. Ultimately there is a reduction of physical strength, muscular insecurity, tremblings, inco-ordination, great nervous irritation, wandering of the mind, incoherence, insensibility and coma, breathing stertorous and labored, from paralysis of respiration; face cyanosed or flushed, pupils dilated. All exudations contain its odor.

While violent symptoms have often been produced by full medicinal doses of Turpentine, fatal results have seldom occurred. Five ounces have been taken by adults with recovery. Children have died from overdoses in a few instances. The agent is eliminated through the kidneys and mucous membrane, and this fact explains its immediate influence upon these organs and structures.

Specific Symptomatology—In two marked conditions apparently diametrically opposite in their character, this agent is specific.

First. In **excessive secretion of mucus**—catarrhal discharges from whatever cause, especially if there is relaxed, enfeebled,

atonic mucous membranes. It may be given with perfect confidence in all cases with these phenomena.

Second; in **gastric** or **intestinal inflammation**, or in persistent fevers, with dry, red, glazed tongue, dry mucous membranes—tympanites, with *suppression of the secretions* of all gastric and of intestinal glands.

It is also indicated by a steady distress or dull grinding pain in the abdomen, a sensation of hardness across the abdomen, with tendency to constipation, with general inactivity of the entire glandular structure of the gastro-intestinal tract.

It increases the tone and capillary circulation of all the mucous structures, and in the abdomen of the muscular structures of the intestines also. Its antiseptic powers are great, destroying parasites and germs of disease, and inhibiting putrefaction and fermentation.

In intestinal disorders of childhood it prevents the formation of lactic and butyric acids, and the irritation caused by their presence.

Therapy—The specific indications suggest the use of Turpentine in **acute** and **chronic bronchitis** when there is an excessive discharge of mucus. Its influence may be observed from the first.

It controls the cough, allays the excessive bronchial secretion, soothes the irritation throughout the chest, relieves the diffused soreness and promotes the cure. In **pharyngitis** and **laryngitis** it is of value also.

In acute inflammations within the chest its external application is of much value, especially in pneumonitis or capillary bronchitis with diffused soreness. Soreness and tenderness in acute fevers and inflammations are relieved by the external use of Turpentine, while quick, sharp, acute pain is best combated by the external use of mustard and anodyne counter-irritants.

In **croup** its influence is direct. In both the mucous and membranous forms it has accomplished excellent results. It is given internally, applied externally, and its vapors are inhaled in these cases for a short time, careful watch being kept for evidences of its irritating influence upon the kidneys. In some extreme cases where it has not been previously used, a single large dose of ten or fifteen drops to a child of five years or above, will apparently exercise a prompt influence.

In **diphtheria** with occlusion of the larynx, throat or nasal passages, from the membrane, it should be dropped on the surface of hot water in a close-mouthed vessel, and the vapor inhaled for a few minutes every two or three hours. It may be used in this manner with excellent results with an equal amount of the oil of eucalyptus. It may be also used in an atomizer for this purpose. In all throat difficulties its external application is beneficial.

It is a remedy for **acute** and **chronic nasal catarrh**, and if given persistently it will prove most serviceable, even in stubborn, chronic cases. In **gastric** or **intestinal catarrh** it is a remedy of much value given in proper doses in palatable emulsion. **Pain** due to this condition is quickly relieved by Turpentine, and atonic, relaxed and enfeebled mucous or muscular structures are quickly restored, and normal function attained.

Turpentine is a most excellent remedy in the treatment of **typhoid**, **typhus** and low forms of **fever**, and in typhoid complications of **acute inflammations**. In these conditions, when the tongue is dry, glazed and dark red, the temperature persistently high, the pulse small, wiry, rapid and feeble, with distension of the abdomen from tympanites, the urine scanty and dark, the intestinal glands ulcerated and intestinal hemorrhage present, Turpentine is certainly a most efficient remedy. Its antiseptic influence is exercised in conjunction with its restorative power over the mucous and intestinal glands. It is given in doses of from two to five drops every two or three hours.

In **peritonitis** or **appendicitis** with any of the above phenomena, with tympanites, the agent is prescribed with only good results.

In all conditions within the abdomen where its internal use is demanded, especially if there is distension of the abdominal parietes from the accumulation of gases, the external use of Turpentine is important. A stupe may be prepared by wringing a piece of flannel out of hot water and sprinkling a few drops of Turpentine over its surface as it is applied. This should be kept hot by being properly covered. A popular domestic method is to melt a small quantity of lard and add to it an equal quantity of Turpentine and apply this freely to the surface. Olive oil is a good menstruum, but an increased proportion of this oil is required because of less density than the lard.

In all cases pain must not be caused by the Turpentine applications. Its influence also upon the kidneys must be watched, and if difficult, painful or burning urination, or scanty urination occurs, or the least blood appears in the urine, it must be stopped at once, at least for a time. In large doses it produces nephritis, strangury and priapism. Inhaled constantly it produce these symptoms in those otherwise healthy.

Turpentine has been used in passive hemorrhages. It prevents the **hemorrhage** of **typhoid** and controls hemorrhage in **gastric ulceration**. It controls hæmaturia given in small doses, in some cases, and also the hemorrhage of scurvy and purpura hemorrhagica. In extreme persistent post-partum hemorrhage, after complete evacuation of the womb, it has been painted over the inner lining of the womb with immediate control of

the hemorrhage. The conditions demanding its use in passive hemorrhage are great relaxation of tissue, lack of tone, dilated and atonic blood vessels, with constitutional depression—conditions permitting a passive transudation of blood.

In **catarrh** of the **bladder** it is an excellent remedy. It may be given in conjunction with other measures or suggested remedies. In all these cases the indications for other remedies should be promptly met to facilitate the action of this remedy.

Turpentine internally is a serviceable remedy for **leucorrhœa**, either of a specific or non-specific character. It has long been used in the treatment of gonorrhœa, but is not the best of our remedies. In pyelitis with excessive mucus discharge, in gleet, in subacute gonorrhœa, it will allay the discharge occasionally when other agents have been inefficient.

Incontinence of urine from relaxation and feebleness of structure has been benefited by Turpentine.

In the treatment of dysentery when the violent phenomena have been controlled, and in some exhausting diarrhœas, Turpentine will be found of much service. It is best given in small doses in such cases. It has been used in yellow fever and in cholera also.

Turpentine is applied to swellings from **chronic rheumatism** of the joints, to **plethoric swellings**, and slow forming abscesses.

It is of much value in **chilblains**, and, although painful, has been painted over small burned areas. It has been used in gangrene also with good results.

Erysipelas has been treated with Turpentine, but we cannot commend its influence.

Turpentine is an efficient anthelmintic for the removal of *tænia*. It is given in a single full dose of from thirty to sixty minims upon rising in the morning. It may be followed shortly by a tablespoonful of castor oil in a teacupful of hot milk. The patient should fast, until the oil operates. All nervous phenomena dependent upon the irritation caused by the presence of the worms will abate with the destruction of the worms. This is not due to any nerve sedative influence of the Turpentine, however.

Whitford has treated nearly thirty cases of **trichina spiralis** with the persistent use of Turpentine. Five drops every three hours was sufficient. The diagnosis in the larger number of the cases was confirmed beyond a doubt. As every case recovered which was so treated his confidence is naturally confirmed in this use of Turpentine. In one case two parties were known to have eaten of a certain lot of pork which on examination was found teeming with trichina. Both were affected in the same manner and death seemed imminent. One was treated with Turpentine and recovered, the other died. In nearly all

of the cases the beneficial results were plainly traceable to the remedy.

BENZOIN.

Part Employed—The balsamic resin from *styrax benzoin*.

Locality—Java, Sumatra and Borneo.

Description—The resin occurs in the form of small tears or lumps, yellowish-brown externally, milk-white internally, with a fragrant, balsamic odor, but with little taste. The bark of the tree is cut through beneath the lower limbs, the sap exudes from the incisions and hardens. It is soluble in five parts of alcohol and in a solution of caustic potassa. The solutions precipitate in water. When heated it emits a white, thick, pungent vapor and melts.

The agent is important principally because it is convertible into benzoic acid, and thence into benzoate of sodium and other more widely applicable compounds.

Therapy—Benzoin is stimulant and expectorant. It is not used extensively. The only form is the **Compound Tincture of Benzoin**. It is vaporized in hot water, and the vapor is inhaled in chronic and **acute laryngitis**. It is useful in many forms of bronchial irritation without secretion. Its antiseptic properties are not great, but are apparent where there is a scanty, fetid expectoration.

AMMONIUM CHLORIDE.

Formula— NH_4Cl .

Synonyms—Ammonium Muriate, Chloride or Muriate of Ammonium.

Occurrence—It came originally from the borders of the African desert, where it was obtained by subliming the soot which was collected from the burning of camels' dung.

In China it is obtained from the water of volcanic springs. It is found in the vicinity of many volcanoes. It is at present derived from the ammoniacal liquor of gas works. It is a product of the decomposition of excrete animal matter.

Description—It occurs as a white, transparent, tough, fibrous, peculiarly crystallized salt, without odor and with an intense, pungent, salty taste. It is soluble in three parts of cold water and in one part of boiling water, quite insoluble in alcohol. Dose, from three to ten grains.

The taste should be obscured in an aromatic syrup.

Physiological Action—In its influence it exhibits the peculiarities of ammonia. It is not widely different in its action

from the carbonate, but does not act powerfully upon the heart and is less transient in its effects.

Therapy—Its common use is in the treatment of **bronchitis**. In the conditions where a stimulant expectorant is needed, as mentioned of the ammonium carbonate, its administration being more easily rendered pleasant, it is more commonly used than the carbonate. It is a common ingredient of many extemporized cough syrups. It is especially useful in **catarrh** of the **bronchi** with relaxed and debilitated mucous membranes.

Catarrhs of all kinds are promptly influenced by its use, whether they be nasal, gastric, intestinal, or gastro-intestinal, or catarrh of the bladder, or leucorrhœa, wherever there is an abundant thick secretion from the mucous membrane.

In **catarrh** of the **stomach**, with excessive acid secretion and constant pain during digestion, ten grains of this salt before meals is often productive of complete relief and subsequent cure.

Prof. Whitford for many years has advised this agent as a specific in **neuralgias**. It is indicated in those of a rheumatic character, and those of a distinctly malarial type, with a tendency to periodicity, especially if occurring in the face or head. In those cases where belladonna is not contraindicated, he gives the two agents in conjunction in full doses. It is a serviceable remedy and his experience is confirmed by that of such men as Watson, Anstie and Ringer. To give relief it must be given in doses of from ten to thirty grains. Small doses are of but little benefit.

This agent is recommended highly in **chronic inflammation** of the **liver** with torpor and engorgement. In **catarrhal jaundice** it stimulates the liver, working actively in harmony with many of our organic remedies. In other glandular affections it is of much value, especially where there is chronic enlargement. This applies to **mastitis**, **ovaritis** and **prostatitis**. A solution of the salt applied to enlarged glands is very efficacious, promoting removal of the enlargement. It is also applicable to contusions and indolent tumors and is applied to **senile gangrene**.

ACIDUM ACETICUM.

Formula— $C_2H_4O_2$.

Synonyms—Acetic Acid, Pyroligneous Acid, Acetyl Hydrate or the Hydrogen Acetate.

Description—A colorless, mobile liquid with a pungent odor and a sharp, characteristic acid taste. When pure it crystallizes at 62.6 deg. and boils at 246 deg. Fahr. Its specific gravity is 1.08 at the freezing point of water.

Occurrence—Acetic Acid is produced by the destructive distillation of wood. The crude pyroligneous acid of commerce contains four per cent of Acetic Acid and twenty per cent of oily and tarry substances. This is distilled, and the distillate is acted upon in a complex process, by slacked lime, and the after product by sulphuric acid. The Acetic Acid is finally separated by distillation.

The ordinary liquid Acetic Acid, U. S. P., contains thirty-six per cent of the pure acid dissolved in water. The pure, free, absolute acid is known as the **Glacial Acetic Acid**. It contains ninety-nine per cent of the acid.

Vinegar is a liquid made from the juice of apples, acidulated with Acetic Acid, which is produced therein by the ferment *mycoderma aceti* in the natural process of *acetous fermentation*. Alcoholic fermentation first takes place in the fermenting substance, and this is followed by the acetous fermentation, produced artificially by the introduction of the characteristic ferment, or *mother of vinegar*.

Physiological Action—Acetic Acid produces vesication and corrosive action on animal tissues. In sufficient doses it is a corrosive poison.

Therapy—In **spasmodic croup** a few drops quickly volatilized on a hot surface, or on the surface of boiling water, will often give quick relief in breathing. Its vapor is often diffused in the room from hot water in cases of dry, **bronchial cough**, in bronchitis, with excellent results. It is useful also in **diphtheria** and **membranous croup**, both internally and externally. It is of service in syrups forming an acetous syrup of many well known expectorants, such as sanguinaria, ipecac, lobelia and squills. The influence of the other constituents is often enhanced by this combination.

This agent is specific in **carbolic acid** poisoning. If Acetic Acid or plain vinegar is at once diluted to a safe strength—one that can be swallowed without strangulation, and given to the patient immediately after taking a dose of carbolic acid, its influences are neutralized immediately, and no appearance of the destructive or poisonous effects of the latter acid are apparent. Henning took a teaspoonful of 95 % carbolic acid into his mouth for a minute or more, then ejecting it, he held dilute Acetic Acid in the mouth for a short time, when all evidences of the carbolic acid disappeared, and no unpleasant symptoms whatever were experienced. Many cases are reported of its prompt action in carbolic acid poisoning.

Many **alcoholics** are in the habit of drinking vinegar diluted with water to cut short a debauch, claiming that it produces steadiness of action and overcomes the intoxicating effects of alcohol.

This acid is used as a reagent in the laboratory. It is used

also in the preservation of food stuffs, as it is actively antiseptic. Its vapor has been used as a stimulant, inhaled in asphyxia and syncope.

It has been used in the treatment of **venereal sores** and other specific ulcers and in cancers, and it has been applied to gangrenous degeneration. Its use in medicine is not wide.

ETHYL IODIDE.

Formula— C_2H_5I .

Synonyms—Iodide of Ethyl, Hydriodic Ether.

Occurrence—This substance is formed by a chemical combination occurring when iodine, alcohol and phosphorus are brought into contact.

Description—It is an unstable, colorless and very volatile liquid, with irritating, pungent fumes of a most disagreeable odor, especially if any impurities are present.

Physiological Action—It is an antispasmodic and nerve stimulant, and if its inhalation is prolonged, a powerful anæsthetic. It is not in use for this purpose, because of the large quantity necessary to produce anæsthesia.

Therapy—Bartholow advised the occasional inhalation of from fifteen to twenty drops of the Iodide of Ethyl in the treatment of **pneumonia**, claiming that it promoted resolution. Turnbull, Fisher and others claimed excellent results from its use by inhalation in the treatment of persistent cough of **phthisis** and **chronic bronchitis**. Huetle believed it of more service in these conditions, because of the fact that iodine is thus rapidly supplied to the system by its inhalation.

Its use is suggested in **catarrhal bronchitis** as a stimulant to the mucous surfaces. It is applicable in nasal catarrh for the same purpose. In **emphysema** and in **asthma** it may be used, and its influence is often superior.

CHAPTER IV.

Respiratory Sedatives and Mild Tonics.

PRUNUS VIRG.
TOLU.SENEGA.
ALLIUM.YERBA SANTA.
LIQUORICE.

PRUNUS.

PRUNUS SEROTINA.

Synonym—Wild Cherry.**Part Employed**—The bark, collected in autumn.**Natural Order**—Rosaceæ.**Locality**—North America.

Botanical Description—The name *Prunus Virginiana* has been wrongly applied to the tree from which wild cherry bark is derived, as this name was given by Linnæus to the choke-cherry. The official species, or wild black cherry, is one of the largest trees of the American forest; eighty to one hundred feet high, trunk from twelve to eighteen feet in circumference, with a black, rough bark; as usually met with, however, it is much smaller. The leaves are alternate, oblong, smooth, thickish or of firm texture, taper-pointed, serrulate, with short incurved teeth, bright green, shining above, three to five inches long, half an inch wide, with two pairs of reddish glands at the base; flowers white, in long racemes; calyx with sharp segments; fruit an ovoid drupe, size of a pea, purplish-black, pulpy, edible.

Wild cherry bark of commerce is in curved pieces or irregular fragments, one-twelfth to one-eighth of an inch thick, one to two inches long, one-half to one inch wide, outer surface greenish-brown or yellowish-brown, smooth, somewhat glossy, marked with transverse scars; if the bark is collected from old wood and deprived of the corky layer, the outer surface is nut-brown and uneven; inner surface somewhat striate and fissured; macerated in water it has a bitter almond odor; taste astringent, aromatic, bitter; bark of the very large and very small branches should be rejected—(U. S.) Solvents, alcohol, water. Dose, from a half to one dram.

CONSTITUENTS—Hydrocyanic acid, amygdalin, volatile oil, emulsin, tannin, gallic acid, resin, starch, a bitter principle.

PREPARATIONS—Extractum Pruni Virginianæ, Fluid Extract of Wild Cherry. Dose, from a half to one dram. Specific *Prunus*. Dose, from one to ten minims.

Therapy—The tonic influence of this agent is more markedly apparent when it is administered in disease of the respiratory apparatus of a subacute or chronic character. It is not given during the active period of acute cases, but is of value during the period of convalescence.

It is a common remedy in the treatment of **chronic coughs**, especially those accompanied with excessive expectoration. It is valuable in **whooping-cough**. The syrup is used as a menstruum for the administration of other remedies in this disease. It is excellent also in reflex cough—the cough of nervous patients without apparent cause. The syrup may be used persistently in **phthisis**, for the administration of many other agents which seem to be indicated during the course of the disease. Wild Cherry is popular in the treatment of mild cases of **palpitation**, especially those of a functional character, or from reflex causes. Palpitation from disturbed condition of the stomach is directly relieved by it. It is said to have a direct tonic influence upon the **heart** when the **muscular structure** of that organ is greatly weakened, where there is dilatation or valvular insufficiency, especially if induced by prolonged gastric or pulmonary disease.

As a remedy for **dyspepsia** it has many advocates. It is a tonic to the stomach, improving digestion by stimulating the action of the gastric glands. It soothes irritability of the stomach from whatever cause. Although the properties of a nerve sedative are not ascribed to this agent, general nervous irritation is greatly soothed by its administration, nervous irritability of the stomach and of the respiratory organs is allayed, and a tonic influence is imparted to the central nervous system.

TOLU.

BALSAM TOLU.

Part Employed—A balsam obtained from *Myroxylon Toluifera*.

Locality—Central America.

Natural Order—Leguminosæ.

Occurrence—Incisions are made through the bark of the tree of a V shape, through which the sap exudes into cups placed for its collection.

Description—It is at first syrupy and tenacious, afterward hard and brittle, of a bronze-yellowish-brown color with a warm, pungent taste and a fragrant odor. It is soluble in alcohol, chloroform and ether, insoluble in water.

PREPARATIONS—Syrupus Tolutani, Syrup of Tolu; dose, from two to six drams. Tinctura Tolutani, Tincture of Tolu; dose, from one-half dram to two drams.

Physiological Action—The remedy is disinfectant—antiseptic, and when applied to the skin and to raw surfaces it is stimulant. It promotes healing of wounds and restores impaired and abnormal conditions of the skin. It is direct in its action upon mucous membranes, exercising a tonic and healing influ-

ence and restoring deficient secretion. It is eliminated freely through these membranes and through the kidneys, hence its beneficial action upon these structures.

Therapy—The agent is used in all forms of **bronchial irritation**. Its influence is not so readily observed in the acute forms as in the subacute and chronic forms. It is not sufficiently active to be depended upon to the exclusion of other more direct remedies, but it is serviceable in facilitating the action of these remedies and in modifying the action of stimulating or irritating expectorants.

In the treatment of the various forms of **cough**, induced by disease of the bronchi, the direct remedies may be often administered to excellent advantage in the syrup of Tolu. Short, sharp, hacking, dry coughs are directly benefited by its use. On the other hand, coughs, accompanied with an extreme outpour of thick mucus, with an atonic, relaxed condition of the mucous membranes, are relieved by this agent.

It is serviceable in **pharyngitis** and in **laryngitis**. In **whooping-cough** it is an excellent menstruum for the administration of the direct remedies.

In diseases of the gastro-intestinal tract, or of the kidneys where turpentine is indicated, that agent may be administered to an excellent advantage in the syrup of Tolu.

SENEGA.

POLYGALA SENECA.

Synonym—Senega Snakeroot.

Part Employed—The root.

Natural Order—Polygalaceæ.

Locality—North America.

Botanical Description—A perennial plant with a simple, round, smooth, erect, leafy stem, from eight to fifteen inches high, green above, reddish-purple below; leaves bright green, from one to two inches long and half of an inch wide; alternate lanceolate; tapering, sessile, margins rough; flowers in May and June, white, in terminal spike form raceme, lateral sepals round, rose-colored, five in number, corolla closed; fruit a two-celled capsule, two black compressed seeds; root ligneous, with tortuous branches; spinal keel from base to tip of root branches, bark whitish internally, yellowish-gray externally; thick; nauseous odor; bitter, acrid taste. Solvent, hot water; dose, from three to twenty grains.

CONSTITUENTS—Senegin, polygalic acid, fixed oil.

PREPARATIONS—Extractum Senegæ Fluidum, Fluid Extract of Senega; dose, from five to twenty minims. Tinctura Senegæ, Tincture of Senega; dose, from one-half to two drams.

Syrupus Senegæ, Syrup of Senega; dose, from one to two drams. Specific Senega; dose, from one to five minims.

Therapy—Senega is an active, stimulating expectorant, applicable to cases of subacute or chronic **bronchitis**, with general enfeeblement and persistent cough. It has an antispasmodic influence and is used in **asthma**. It is of service in certain cases of persistent cough with scanty expectoration in **pneumonia**. It is especially advised in the **chronic bronchitis** of the **aged** and in **emphysema**.

Diuretic properties are attributed to this agent, and it has been prescribed with apparent advantage in **dropsy** from inefficient renal action. In suppression of the urine it has served a good purpose. An infusion is the best form of administration in kidney disorder.

ALLIUM.

ALLIUM SATIVUM.

Synonyms—Garlic, Onion.

Part Employed—Bulb, without drying.

Locality—Grows wild, and is cultivated in all parts of the temperate zones and in the subtropics.

Botanical Description—A bulbous, perennial plant, usually with a single bulb; sometimes numerous bulbs, or the bulb compounded of wedge-shaped bulblets, enclosed in a membranous covering. From the base of the bulb the roots proper descend; the stem is from twelve to thirty inches in height, simple, terminating in a cluster of flowers and bulbs. The leaves sheathe the lower half of the stem, and are flat and long, grass-like in character, but wider. The taste is pungent, acrid and stimulating; the odor is permanent, disagreeable and alliaceous. It is soluble in water, alcohol, ether and acetic acid.

CONSTITUENTS—It contains an essential, volatile oil, mucilage, sugar and albumen.

Administration—The fresh juice is used in medicine, the crushed bulbs are used externally, and a tincture is prepared, of which from five to thirty drops is the dose.

Physiological Action—There is positive proof of the antiseptic properties of this agent.

As an antiseptic and preventer of disease it has no equal. One writer claims that diphtheria does not occur in families that are free partakers of the onion in any way. With many it produces flatulency. If used moderately for a while the quantity can be increased without unpleasantness. The odor is no more unpleasant than that of carbolic acid, creolin, asafoetida and some others.

Covert gives the following facts concerning the common onion: "The volatile oil is the essential part of the onion, and

has not only gastronomic but therapeutic merit. The onion is expectorant, stimulant, diuretic, rubefacient and discutient; and as a domestic remedy is well remembered by the oldest inhabitant in the form of onion syrup, onion draughts, onion poultices and the like. As a domestic remedy always at hand and of varied virtues it stands unrivalled."

The onion poultice stands in high favor with me for all **swellings**, such as that of the throat in scarlet fever and diphtheria. It was long declared of much importance in the treatment of **croup** and as an application to the chest in all inflammations of the lungs and bronchi. My method is to pound the raw onions into a soft pulp and apply in the cloth in which they were pounded, changing every few hours as soon as they become dry. A fine expectorant may be prepared by shaving onions into a covered dish, covering with sugar and slices of lemon if wished, and then placing the dish into a hot oven until the juices are well extracted. The result is a palatable syrup, agreeable to children of all ages, and highly beneficial in ordinary colds, coughs, laryngitis, bronchitis and croup.

The juice of an onion roasted in hot ashes is a favorite remedy with some as a poultice for earache, and for boils. A raw onion applied to a bee sting is prompt and effectual in neutralizing the poison.

Expressed onion juice with sweet milk is a very effective remedy in some cases of dropsy, where a stimulating diuretic is indicated. I might cite cases in practice of anasarca cured by an onion and milk diet. It stimulates the kidneys to a greatly increased flow of urine.

I have often observed that families in the habit of using onions freely as an article of diet escape epidemic diseases, although their nearest neighbors may be having scarlet fever or diphtheria. My experience teaches me that onions and sassafras are among our most reliable prophylactics. I have prevented the spread of many contagious diseases, even in the same household, by their timely use.

To exempt from whooping-cough I have placed about the neck of the child a string of garlic or small onions. To corroborate their efficacy as a preventive, I might adduce many instances coming under my observation.

An onion may be roasted and the cut surface applied hot to glandular inflammations and suppurating tumors."

Bloyer advises the tincture of the **Red Onion** in gravel. The specific indications are extreme urinary irritation, with a constant desire to urinate and the passage of calcareous concretions. Hemorrhage and pus and mucous are often present from inflammation of the bladder. The cystoscope shows the bladder walls greatly thickened, nodulated and imbedded with concretions of various sizes. This persistent and almost in-

curable condition has been quickly cured by a tincture of the Red Onion and the tincture of cocklebur in equal parts, from fifteen to twenty drops given every three hours. The cure of this condition alone by the agent, will give it a place in therapeutics.

ERIODICTYON.**ERIODICTYON GLUTINOSUM.**

Synonym—Yerba Santa.

Part Employed—The leaves.

Natural Order—Hydrophyllaceæ.

Locality—California.

Botanical Description—Yerba Santa is a perennial evergreen shrub, three to five feet high, found throughout California and the Pacific Coast, growing on rocky hillsides and mountain ranges, flowering in June; stem covered with bark near the base, smooth, green, herbaceous above, much branched; leaves lanceolate, three to six inches long, elliptical, petiolate, firmly dentate, alternate, smooth, dark-green above, silvery-pubescent beneath; flowers pinkish or purplish-blue, densely clustered, racemed; corolla tubular, funnel form half an inch long, five-lobed; calyx five-parted, hirsute; stamens five, three long and two short; fruit capsule one-celled, containing twelve to twenty-four shriveled, brownish seeds attached to the two parietal placentæ. The leaves should be gathered in the latter part of June. Taste balsamic, aromatic; solvent alcohol; dose, from one-fourth to one dram.

CONSTITUENTS—Volatile oil, fixed oil, ericolin, eriodictyonic acid, resin, gum, tannin.

PREPARATIONS—Extractum Eriodictyi Fluidum, Fluid Extract of Eriodictyon; dose, from a half to one dram. Specific Yerba Santa; dose, from five to twenty minims.

Therapy—Yerba Santa has a soothing influence upon irritating, dry, hacking, persistent **cough**.

It has much value in **chronic bronchitis**, **chronic pneumonia** and in **phthisis pulmonalis**, in allaying the cough which seems to increase the patient's feebleness and advance the development of the disease. It is an excellent remedy combined with *grindelia robusta*. It acts well in all forms of cough where there is dryness of the mucous membranes, in conjunction with other directly indicated remedies. It is prepared in the form of a syrup, and like *prunus virginiana*, can be made a basis or vehicle for other agents. The syrup conceals the bitter taste of quinine admirably.

GLYCYRRHIZA.

GLYCYRRHIZA GLABRA

Synonym—Liquorice.

Part Employed—The root.

Natural Order—Leguminosæ.

Locality—Southern Europe, Asia.

Botanical Description—The Liquorice plant is a perennial; stem two to three feet high, erect, smooth, striated, with few branches, of a gray color; leaves imparipinnate, alternate; leaflets ovate, four to seven pairs, entire, glutinous beneath, smooth, dark-green, petiolate; flowers small, purplish, in axillary erect spikes, supported on long petioles; calyx tubular, five-cleft, persistent; corolla a straight ovate-lanceolate vexillum; keel biparted, acute, straight; fruit legume oblong, compressed, brown, acute, one-celled, containing one to six small kidney-shaped seeds; root round, succulent, tough, running to a considerable length and depth, with underground stems, grayish-brown externally, furnished with sparse fibers. The variety *G. glandulifera* has the stem, leaves, seeds and pods more or less glandular and pubescent or prickly.

Liquorice root of commerce is in cylindrical pieces, six to twelve inches long, one-fourth to one inch thick, longitudinally wrinkled, straight, covered with a grayish-brown, warty cork, pliable, tough, breaking with a coarsely fibrous fracture; bark thick, wood porous, dense, in narrow wedges, medullary rays linear; taste sweet, acrid. The *G. glandulifera* is in pieces one-third to one and a half inches thick, six to eighteen inches long, often without corky layer; taste sweet, bitter. Solvents, alcohol, water. Dose, from fifteen to sixty grains.

CONSTITUENTS—Glycyrrhizin, glycyramarin, asparagin, resin, sugar, starch.

PREPARATIONS—Extractum Glycyrrhizæ, Extract of Glycyrrhiza, (Extract of Liquorice). Dose, *ad libitum*. Extractum Glycyrrhizæ Fluidum, Fluid Extract of Glycyrrhiza. Dose, *ad libitum*.

Therapy—The agreeable taste of Liquorice in any form covers to a practical extent the taste of very many disagreeable remedies. Acrid and bitter tastes are well disguised by it. A syrup made by adding two parts of the fluid extract to fourteen parts of simple syrup will disguise the bitter or otherwise unpleasant taste of a large proportion of the fluid extracts. The taste of quinine can be concealed by it.

Its demulcent properties render it useful in inflammation, or irritation of the mucous membranes of the lungs and bronchi. In combination with ipecac, lobelia, squill, sanguinaria, or ammonium chloride, an excellent expectorant mixture or cough syrup may be extemporized, as this agent modifies any acrid or irritating influence the other agents may exhibit.

The virtue of the **compound Liquorice powder** of the dispensatory does not depend upon the properties of the Liquorice, only as it imparts to the whole a pleasant taste.

CHAPTER V.

Respiratory Sedatives and Tonics.

CASTANEA.

LIPPIA MEX.

AMYLENE HYDRATE.

CHEKEN.

HYSTERIONICA.

CASTANEA.

CASTANEA VESCA.

Synonym—Chestnut.

Part Employed—The leaves.

Location—United States and Europe.

PREPARATIONS—Fluid Extract of Castanea; dose, from ten to forty minims. Tincture of Castanea; dose, from fifteen to sixty minims.

Botanical Description—A tall well-known tree varying in height in different localities. The leaves are from four to ten inches long and about two inches wide, oblong-elliptical, with a pointed tip, sharply but unequally serrated, of a bright green color; the nerves are conspicuous on the under surface; almost odorless; bitter, astringent taste.

Physiological Action—The agent has an apparent mild depressing influence upon the nerve centers, which is plainly evidenced in its influence upon mild spasmodic conditions, and especially upon **spasmodic cough**.

Therapy—It is lauded as a specific for **whooping-cough**. The evidence adduced would lead to the conclusion that certain conditions, not yet determined, must be present if the agent exercises curative powers. In certain experiments it has apparently ameliorated the symptoms promptly and most satisfactorily. In some cases there was a prompt arrest of the disease. In other cases no results have been apparent. The preponderance of evidence is in favor of the agent in this disease. It should receive thorough investigation to determine the specific conditions in which it will exercise a curative influence.

It should be given in full doses every two or three hours. If it proves curative in whooping-cough it should be found of service in other bronchial coughs with free secretion.

LIPPIA.**LIPPIA MEXICANA.**

Synonym—*Lippia Dulcis*.

Part Employed—The leaves and stalks.

Natural Order—*Verbenaceæ*.

Locality—Cuba, Central America, Colombia.

PREPARATIONS—Concentrated tincture, miscible with water without material precipitation. Four parts of the tincture equals one of the drug; dose, one-half to one dram. Fluid Extract *Lippia*; dose, ten to twenty minims.

Botanical Description—*Lippia Dulcis* is a creeping, diffuse shrub, covered more or less thickly on all its parts with minute glandular hairs, with somewhat terete, procumbent branches, sending out rootlets on the lower side, leaves opposite, one and one-half inches in length. The plant is in bloom from November till March, and is very widely distributed in tropical America, growing abundantly almost everywhere, but preferring moist and rich ground. All its parts are characterized by a lemon-like taste and odor.

Specific Symptomatology—Persistent, dry, hard, ringing or resonant bronchial cough. The use of this agent is limited to the air passages.

Therapy—It is useful in **asthma** and **chronic bronchitis**. It is peculiarly sedative to the entire mucous surfaces of the post-nasal region and bronchial tubes. It is soothing, expectorant, and relieves irritability of these surfaces. It quiets hacking cough and chronic bronchial cough of any character. The experience of the writer has proven it specific in the peculiar, deep, resonant, barking, winter cough, without secretion, common to many ladies in the northern States, usually absent in the summer, very persistent, stubborn and difficult to cure. This cough, *Lippia* has cured for the writer in several cases. In every case the cough failed to recur in the following winter, as it had recurred before in several preceding winters.

PENTHORUM.**PENTHORUM SEDOIDES.**

Synonym—Virginia Stonecrop.

Part Employed—The whole plant.

Natural Order—*Crassulaceæ*.

Locality—North America.

Botanical Description—*Penthorum Sedoides* is a homely perennial plant, growing in wet places and along roadsides, flowering from July to September; stem erect, ten to sixteen inches high, branched and angular above; leaves lanceolate, acute, sessile or nearly sessile, sharply or unequally serrate or serrulate; flowers small, nearly sessile, yellowish-green, in one-sided racemes, which are recurved at first, at length spreading;

calyx five-sepaled, united at the base; corolla generally wanting; pistils five; stamens ten; carpels united, five-angled, five-celled, five-beaked; seeds numerous, minute. Solvent, alcohol. Dose, from one to five grains.

PREPARATIONS—Specific Penthorum. Dose, from one to twenty minims.

Specific Symptomatology—It is suggested in cases of **chronic disease** of the **fauces**, larynx, or pharynx, where the mucous membranes are relaxed and of a purple color, irritable, sore and dry. This condition sometimes resists all ordinary throat remedies. Five drops of specific Penthorum every two hours with a gargle of capsicum, quite strong, used three times daily, will quickly relieve the troublesome condition. The gargle alone is of benefit.

Therapy—It influences the functional activity of the stomach through the direct action on the glandular structure of the mucous membranes. It will impart tone to the stomach and increase the appetite and power of the digestion. It regulates the function also of the entire intestinal tract in a mild, but sometimes very desirable manner.

TRILLIUM.

Synonym—Bethroot.

Part Employed—The root.

Natural Order—Liliaceæ.

Locality—United States.

Botanical Description—Trillium Pendulum is a perennial plant growing in the bogs and rich, damp soils and shady woods, and flowering in May and June; stem simple, erect, slender, about fifteen inches high; leaves ovate or rhomboidal, in a whorl of three at the top of the stem, three to five inches in diameter, on short petioles, green; flowers terminal, white, solitary, nodding, on a recurved peduncle, one or two inches long; rhizome subglobular, oblong, truncate at the lower end, one and a half inches long, one-half to three-fourths inch in diameter, with circular rows of straw-colored rootlets; externally orange-brown, internally yellowish; taste sweetish, astringent, acrid, bitter. Solvents, alcohol, water. Dose, from half a dram to one dram.

There are several species of Trillium, all possessing similar medicinal properties.

CONSTITUENTS—An acrid principle, a resin, tannic acid.

Therapy—Trillium influences mildly the nerve supply of the organs of the thorax. It assists **heart** remedies in relieving simple functional irritation. It cures **catarrhal bronchitis**

TRILLIUM PENDULUM.

when there is very profuse expectoration. It soothes the cough of incipient **phthisis**, especially where there is a tendency to hemorrhage, over which it has a marked controlling influence. It restrains excessive action of the kidneys. At one time it had an excellent reputation in the control of **diabetes insipidus**.

It controls **uterine hemorrhage** of a passive character to an excellent advantage, especially **menorrhagia** and **metrorrhagia**. Excessive vaginal catarrh is restrained by it.

AMYLENE HYDRATE.

Formula— $C_5H_{12}O$.

Synonym—Dimethylethylcarbinol

Description—This substance, one of the alcohols, is a dense colorless liquid with a characteristic penetrating odor. It is soluble in eight parts of water, from which it precipitates upon heating. It is soluble in alcohol, ether and chloroform.

Administration—It is given in capsules in doses of from ten to thirty minims for adults, but children being susceptible must not have above three minims; from one to two minims will generally suffice.

Therapy—It is advised as a remedy for **whooping-cough**. It is antispasmodic in all **coughs** of this character. It is a **hypnotic** of a reliable character and may be depended upon in some stubborn cases of insomnia. It is not anodyne and has but few unpleasant effects.

CHEKEN.

EUGENIA CHEKEN.

Synonym—Myrtus Cheken.

Part Employed—The leaves.

Natural Order—Myrtaceæ.

Location—Western coast of South America.

Botanical Description—It is a dense shrub or small tree from five to fifteen feet high; the leaves are opposite, feather veined, the inflorescence centripetal, pedicels one-flowered, opposite to the axils, solitary; the berry is pulpy or subdrupaceous, with few seeds in a membranous shell.

CONSTITUENTS—The berry contains an ethereal aromatic oil, and has the character of cloves and allspice, which are of the same family.

PREPARATION—Extractum Cheken Fluidum, Fluid Extract of Cheken; dose, from one to three drams.

Therapy—This agent acts upon the chest and especially upon the **bronchi**. It overcomes **congestion** in the **air cells** and relieves distressed breathing from acute causes, and cures

bronchial cough. It is of much value in persistent winter cough and in **purulent bronchitis**. Single doses will sometimes give relief for some hours. With its beneficial influence upon the cough the general strength improves, the appetite returns and the patient observes a general marked sense of well-being. Its influence in chronic, persistent, intractable and distressing coughs should be observed.

HYSTERIONICA.

HYSTERIONICA BAYLAHUEN.

Synonym—Haplopappus Baylahuen.

A composite herb, indigenous to Chili and other parts of South America.

CONSTITUENTS—An acrid resin, fragrant, of sharp taste and yellowish-brown color; a fatty oil containing the odor of the plant; a volatile oil, and tannin.

Administration—A decoction of the plant one part to five; dose, a tablespoonful. The Fluid Extract; dose, five to twenty minims. The Tincture; dose, ten to thirty minims.

Dujardin-Beaumetz made a thorough investigation of the therapeutic properties of the plant and pronounced it of much value.

It has been used in disease of the lungs. In **chronic pneumonitis** and **chronic bronchitis** it relieved the **cough** and altered the character of the sputum promptly, and produced a general sense of well-being.

It is an active intestinal antiseptic. It controls diarrhoeas from septic causes most promptly, where ordinary astringents are impotent. In phthisis it improves the general condition and speedily controls the diarrhoea.

In **chronic cystitis** it exercises an active influence in curing bad smelling urine and in reducing the frequency and pain of passage. It deserves careful observation, as its influence is prompt and satisfactory.

GROUP IV.

Agents Acting upon the Stomach.

CHAPTER I.

Agents which Increase the Normal Functional Activity of the Stomach— Stomachics.

COLLINSONIA.	EUPATORIUM PERFOLIATUM.	SALIX ALBA.
CALUMBA.	LYCOPODIUM.	SALICIN.
GENTIAN.	CROCUS.	RHUS GLABRA.
GLYCERINE.	QUASSIA.	CORNUS FLORIDA.

Note—Although here presented at length, it is the opinion of the author that the properties of the larger number of the mild vegetable tonics presented in this group are possessed almost entirely, if not entirely, by a few of the more active remedies of this class, such as hydrastis, nux vomica, gentian, columbo and quassia, and that a complete knowledge of the more active agents only is essential.

There is great similarity in the influence of such remedies as cornus florida, ptelia, liatris, fraseria, asarum and others of this character, and their action is exceedingly mild throughout the entire field of their operation. They have no pronounced influences, their action is fully covered by the more active agents, which possess an essentially wider and more positive influence.

COLLINSONIA.

COLLINSONIA CANADENSIS.

Synonym—Stone Root.

Part Employed—The whole plant.

Natural Order—Labiatae.

Locality—North America.

Botanical Description—Collinsonia is a perennial herb, three or four feet high, flowering from June to September; stem quadrangular, pubescent above; leaves opposite, petiolate, three to eight inches long, broadly ovate, thin, nearly smooth, pointed, heart-shaped at the base, coarsely serrate, dotted beneath; flowers on slender pedicels in paniced racemes; corolla greenish-yellow, two-thirds of an inch long, funnel-form, bilabiate, lower lip elongated and fringed with two exserted stamens; rhizome horizontal, irregularly branched, three to six inches

long, knotty from stem scars, bearing many simple rootlets, grayish-brown externally, bark thin, wood whitish; taste nauseous, bitter. Solvents, alcohol, water; dose, from half to one dram.

CONSTITUENTS—Volatile oil, resin.

PREPARATIONS—Specific *Collinsonia*. Dose, from one to sixty minims.

Extractum *Collinsoniæ* Fluidum, Fluid Extract of *Collinsonia*. Dose, from two to fifteen minims.

Tinctura *Collinsoniæ*, Tincture of *Collinsonia*. Dose, from five to thirty minims.

All preparations should be made from the green plant.

Physiological Action—*Collinsonia* stimulates the stomach, promoting its own absorption. It is actively tonic in its influence upon the entire function of this organ, and from this influence its beneficial action is exercised upon the function of all the vital organs.

Collinsonia acts as a tonic to enfeebled muscular structure of the heart. It is conspicuous in its ability to overcome relaxed and out of tone conditions of the walls of the veins. It has a direct influence upon atonic and dilated or otherwise impaired conditions of the veins and venous capillaries.

Specific Symptomatology—In **piles** with a sense of fullness, or of a foreign body in the rectum, in all relaxed conditions of the mucous membranes of the lower bowel, *Collinsonia* is the remedy. It works more promptly if there is passive congestion with blueness or dark discoloration of the membranes, showing imperfect venous capillary circulation.

Therapy—It is a specific remedy for **hemorrhoids**. If they are of recent origin they can be cured in from three days to a week with this agent. The most intractable cases will be relieved and permanently benefited by its persistent use.

In **catarrhal gastritis**, where the circulation is defective, *Collinsonia*, either alone or combined with *hydrastis*, is of first importance. These agents combined improve the tone of the stomach, strengthening its walls and its mucous membranes, and increasing the strength and character of its glandular structure. They increase the appetite and greatly improve the digestion and assimilation of food.

This combination is a superb general tonic in relaxed and debilitated conditions, and combined with iron can hardly be excelled.

Acute inflammations do not promptly yield to *Collinsonia* although it is an excellent auxiliary to the indicated treatment.

When piles are operated upon, this remedy may be given before and after the operation to most excellent advantage. The author has cured many cases by combining equal parts of the fluid extracts of *Collinsonia* and *hamamelis virginica*, and

giving from twenty to thirty drops of the mixed extracts every two hours. The distilled extract of hamamelis can be injected into the rectum, or kept in contact with the external piles by a compress, especially during sleep. Or an occasional application of the liquor of the persulphate of iron in full strength can be made to stubborn external piles.

Collinsonia is of great value in the hemorrhoids of the pregnant female, with imperfect venous circulation in the pelvic viscera.

Pain in the rectum from whatever cause, especially pain not attributable to a definite cause, and pain after surgical operations, is quickly and more or less permanently relieved by Collinsonia. In pain in the lower bowels, persistent and steady, Collinsonia is specific. Either single full doses, or doses of five minims of the tincture every ten minutes, should be given in water. It is far superior to opium in some cases.

It is recommended as a remedy for diseases of the bladder, but it could hardly be of service unless in cases of over-distended, relaxed and enfeebled walls and muscular structure of this organ, with imperfect capillary circulation, perhaps accompanying hemorrhoids.

Collinsonia is a **heart tonic** of direct and permanent influence. It does not seem to stimulate the heart to sudden action, but its continued use induces steady, permanent and highly satisfactory improvement in the strength and character of the organ, and a correspondingly improved general circulation.

It is valuable when the heart is debilitated from protracted fevers, or from **rheumatic inflammation** or from overstrain. It will be found excellent in the **bicycle heart**, in conjunction with small doses of cactus grand.

In chronic **laryngitis** or **pharyngitis**, with relaxed walls of the larynx or pharynx, with dark discoloration and enfeebled capillary circulation, Collinsonia exercises a prompt and direct influence, especially in the condition known as **clergyman's sore throat**, caused or increased by the use of the voice.

In atonic conditions of the circulation of a local character, where **passive hemorrhages** are of frequent occurrence without apparent cause, where there is increasing debility, Collinsonia and hamamelis in conjunction given as above indicated are positively curative.

CALUMBA.**JATEORRHIZA PALMATA.**

Synonyms—Columbo, Columba.

Part Used—The root.

Natural Order—Menispermaceæ.

Locality—Tropical Africa.

Botanical Description—The genus *Jateorrhiza* as now constituted consists of three species, all natives of tropical Africa. It belongs to the natural order Menispermaceæ. The plant which produces the Columbo root of commerce closely resembles the common yellow parilla, *Menispermum canadense*. It is a herbaceous vine, climbing over trees in the forests in the territory of Mozambique and Quilimani. The leaves are alternate, petiolate, cordate and palmately lobed. The flowers are diœcious and borne in pendulous axillary panicles. The female flowers have six sepals, six petals, six abortive stamens and three pistils. The male flowers have the same floral envelopes, and six perfect stamens. The anthers, as in yellow parilla, are four-celled. The plants that produce the root of commerce vary much in the shape of the leaves and in the hispidity of the stem. The root is perennial, and composed of a short rhizome, from which issue a number of fasciculated, fusiform, fleshy roots, sometimes of the thickness of an infant's arm, and covered with a brown epidermis. The roots are collected in the dry season, in March. They are cut in transverse slices, and are then slowly dried in the shade. The drug occurs in nearly circular discs, externally greenish-brown and wrinkled, internally yellowish or grayish-yellow, depressed in the center, fracture short, mealy, odor slight, taste mucilaginous, slightly aromatic, very bitter.

CONSTITUENTS—Calumbin, a white, bitter, crystalline principle. Berberine, the alkaloid, identical with the alkaloid of *Berberis Vulgaris*, Calumbic acid.

PREPARATIONS—*Extractum Calumbæ Fluidum*, Fluid Extract of Calumba. Dose, from three to thirty minims.

Tinctura Calumbæ, Tincture of Calumba. Dose, from twenty minims to one, or even two drams.

Specific Calumba. Dose, from five to thirty minims.

Physiological Action—This agent is a gastric tonic and one of the typical stomach bitters. It increases the flow of the saliva and of the gastric juice, and increases also the appetite and the power of digestion. It is not astringent and does not constipate. It is an intestinal antiseptic to a limited extent and is anthelmintic.

It is similar in action to *hydrastis canadensis*, but does not extend its influence so positively to the nervous system.

Therapy—It is indicated when there is atonicity of the digestive apparatus, especially when there is any irritation what-

ever. In debilitating disease of the stomach or bowels it is an excellent remedy. It is restorative in fevers of all kinds, and improves the general nutrition by the improvement of the tone of the organs of digestion and assimilation. It is useful after protracted **diarrhœas** and **dysentery**, after **cholera infantum** when a non-irritating tonic is needed, and in **cholera morbus**, being of benefit in promoting restoration in these cases. It will relieve the vomiting of this disease, and a few drops of the tincture will also relieve vomiting in **seasickness**, and has been beneficial in the **vomiting of pregnancy**.

It is of value in overcoming **intestinal flatus**, an infusion in inflammatory intestinal disease being most satisfactory.

In **chronic malaria** with marked intermittent fever it is valuable.

GENTIANA.

GENTIANA LUTEA.

Synonym—Yellow Gentian.

Part Employed—The root.

Natural Order—Gentianaceæ.

Locality—Europe.

Botanical Description—The yellow gentian is a large perennial herb, with a thick, hollow stem, two to four feet high, yellowish-green, flowering from June to August; leaves entire, opposite, sessile, five to seven-nerved, ovate, acute, bright green, six to twelve inches long, glabrous; lower leaves which spring from the root are narrowed at the base to form a petiole; flowers large and beautiful, of a yellow color, in cymes of twenty or more; calyx monophyllous, membranous, yellowish, semi-transparent, splitting when the flower opens and reflected when it is fully expanded; corolla two inches long, with six lanceolate, acute segments; stamens five, shorter than the corolla; fruit one-celled, ovate capsule, one and one-fourth inch long, with many-winged seeds.

The root is described as occurring in nearly cylindrical pieces or longitudinal slices, one to two feet long, one inch thick, the upper portion closely annulate, the lower portion longitudinally wrinkled; externally deep yellowish-brown, internally lighter; somewhat flexible and tough when damp, rather brittle when dry; fracture uneven; the bark rather thick, separated from the somewhat spongy medullium by a black cambium line; odor peculiar, faint, more prominent when moistened, taste sweetish, persistently bitter. Solvents, water, alcohol. Dose, from five to thirty grains.

Several species of gentian are found in North America and possess medicinal properties similar to the *Gentiana Lutea*.

CONSTITUENTS—Gentiopicroin, gentisic acid.

PREPARATIONS—*Extractum Gentianæ*, Extract of Gentian. Dose, from two to ten grains.

Extractum Gentianæ Fluidum, Fluid Extract of Gentian. Dose, from five to thirty minims.

Specific Gentian. Dose, from five to thirty minims.

Physiological Action—Tonic in large doses, irritant, causing nausea, vomiting and diarrrhœa. The fresh root is more active than the dry.

Therapy—This is a popular stomachic tonic in cases where enfeeblement has occurred as the result of protracted disease. It has long been given in combination with other tonics or in wine, as an agent in the **dyspepsia** of the aged, or of gouty patients, and in the gastric inefficiency of infants and children, and to a good advantage in **catarrhal diarrrhœa**.

As a tonic to the stomach, and the other organs of digestion and appropriation, it is one of the best remedies we have in those cases where the system is greatly debilitated by protracted disease, especially by exhausting fevers of malarial origin. It is of much value in malarial conditions generally and has been used to a great extent instead of quinine.

When the periodicity has been overcome by quinine this agent is a rapid **restorative** to the system.

The tincture of Gentian is given freely in conjunction with other tonics and with alteratives. It is given with the tincture of iron in the treatment of **anæmia** complicating **malarial disease**. It is given in conjunction with the iodide of potassium where a tonic and alterative is demanded, and given alternately with hydrocyanic or hydrochloric acid, it is sometimes of great value in the **vomiting of pregnancy**.

This agent is perhaps the most valuable of this class. It can be depended upon as a bitter tonic and constant use will establish a confidence in it.

GLYCERINUM.

Synonym—Glycerin, Glycerine.

Occurrence—A peculiar liquid occurring in the decomposition of fixed oils and fats with aqueous fluids. The processes of its manufacture differ in different manufactories. It was obtained originally in the process of the manufacture of lead plaster, and the U. S. P., 1850, authorized this process. Litharge, olive oil and water were boiled together, when the oil was decomposed by the lead oxide to form the oleate of lead, leaving the Glycerine as a bi-product.

On a large scale fats and oils are decomposed, either alone or in the presence of zinc oxide in small quantity, or by the distillation of the fats and oils, in the presence of superheated steam.

Description—Glycerine was discovered by Scheele in 1789, who called it the sweet principle of the oils. It is a colorless liquid of a rather dense syrupy consistency; slightly oily to the touch; without odor and with a warm, pungent and very sweet taste. It abstracts moisture from the atmosphere, has a sp. gr. of 1.25; is soluble in all proportions in water and alcohol, but is insoluble in ether or chloroform. It is permanent undiluted, but a solution in water will slowly volatilize at the boiling point of the water.

Glycerine is a solvent of much power, dissolving iodine, bromine, chlorine and many of their compounds, alkalies and neutral salts, and vegetable acids. It is a solvent of pepsin, and will extract this principle of the stomach from the mucus. In some cases it increases the solvent power of water. It is a powerful antiseptic and will preserve substances, solutions, etc., from decomposition. It is used extensively in pharmacy in the preparation of glyceroles, or preferably, glycerites.

Physiological Action—It produces heat in the esophagus and stomach when swallowed, which to some sensitive patients is exceedingly disagreeable. In greatly excessive doses symptoms not widely different from alcoholic poisoning may be induced.

It is eliminated by the kidneys and will cause dark colored urine, the quantity of which will be greatly increased. It purges in large doses, and by abstraction of water from the tissues, a property it possesses to a high degree, will sometimes induce hydragogue catharsis, especially if introduced into the rectum.

Therapy—For internal use Glycerine is antiseptic, laxative and nutritive, taking the place of cod liver oil to a large extent with children in the latter particular. This fact is denied, but it is capable of demonstration.

It is valuable diluted with equal parts of water to moisten the dry mouth and tongue of protracted fevers, and for the removal of sordes. It prevents decomposition in the stomach and encourages secretion, and if a small quantity be added to ice water and drank regularly in these fevers it is an intestinal antiseptic and nutritive.

In **dyspepsia** Glycerine serves an excellent purpose; holding a fixed quantity of the peroxide of hydrogen in solution, known as **Glycozone**, it is one of the best manufactured products of the present time in its action upon enfeebled disordered stomachs, especially if there is ulceration or **catarrhal gastritis**. It is a most efficient preparation. Glycerine will relieve many cases of pyrosis and excessive gastric acidity. It is useful in chronic intestinal dyspepsia, especially the flatulent variety and in certain forms of chronic constipation, stimulating the secretory and excretory functions of the intestinal glands.

Glycerine injected into the bowels produces prompt and sat-

isfactory evacuation, which renders it valuable with constipated infants, as it stimulates the secretions, encourages normal peristaltic action and may subsequently result in a cure. From half a teaspoonful to a teaspoonful injected at the same time each morning, or with very young infants morning and evening, will establish regular habits of evacuation. A larger quantity is necessary with adults.

Glycerine suppositories are prepared for adults which are often very convenient.

Introduced into the vagina Glycerine will induce a large, in some cases excessive, watery excretion from the tissues, which is utilized as a local depletive in many cases of engorgement of the structure of the womb, in **congestion** and **subinvolution**.

Glycerine is applied to **fissures** and **chaps** of the skin, and is restorative to all cutaneous surfaces. It prevents the action of the atmosphere on these tissues and acts as a lubricant.

It allays **itching** of the skin and heals many forms of **scaly skin disease**, and serves also as a vehicle for the administration of more active skin remedies. It is of much service in eczema, psoriasis, lepra, prurigo, herpes and pityriasis and will modify the pitting in variola.

It is valuable applied to fissured nipples, to indurated glands and to erysipelatous inflammation, either of an acute or sub-acute character.

EUPATORIUM.

EUPATORIUM PERFOLIATUM.

Synonyms—Boneset, Ague Weed.

Part Employed—Flowering tops and leaves.

Natural Order—Compositæ.

Locality—Canada, United States.

Botanical Description—Boneset is a perennial herb, growing in swampy ground and flowering from July to September; stem erect, stout, rough, hairy, one to five feet high; leaves opposite, connate-perfoliate, lanceolate, four to six inches long, tapering to a long point, united at the base, rough, rugose, downy beneath; flowers numerous, white, in dense level-topped corymbs, with oblong involucre of lance-linear scales; florets tubular, with five spreading segments, and a rough down-like pappus; odor feeble; taste bitter. Solvents, alcohol, water. Dose, from one-half to one dram.

CONSTITUENTS—Eupatorin, volatile oil, resin, tannin, wax, gum.

PREPARATIONS—Extractum Eupatoriæ Fluidum, Fluid Extract of Eupatorium. Dose, from ten to sixty minims.

Specific Eupatorium. Dose, from five to thirty minims.

Physiological Action—Stimulating tonic, aperient, diaphoretic, emetic, antiperiodic.

The action of this agent upon the stomach is somewhat unique, differing in some important particulars from that of other stomach tonics.

Therapy—It is valuable in **catarrhal disorders** of whatever nature, whether gastric, intestinal, post-nasal, bronchial or vesical. It has an undoubted soothing influence upon the nervous system, and is of much value in stomach disorders of nervous origin. In a case of neurasthenia of long standing, complicated with emphysema, the patient, an extremely nervous woman, persistently **regurgitated** all the **food** she took. There was no nausea, no vomiting; the food simply came back after it was swallowed. Fifteen drops of the fluid extract of Boneset every two hours was given. The second day the patient was relieved, and there was no return of the disorder after the fifth day, for several months, when it recurred for a short time, but was promptly relieved by the same medicine.

In a case of intractable **hiccough** in an old man, when every possible remedy had failed and death seemed inevitable, Boneset, fifteen drops in an infusion of capsicum, every hour, produced a permanent cure.

It is a typical diaphoretic, although not powerful in its action. In intermittent fever of the severest types, in remittent fever, in continued fevers of any type, and in the exanthemata, given in hot infusion in the early stages it produces delightful results.

Dr. Locke says the remedy is specific in **masked intermittent fever**, in which there is sluggishness of every function and irregular occurrence of chill and fever, the fever followed with but little reaction and almost no perspiration, but with severe aching in the bones. He uses the infusion, made by steeping one ounce of the foliage of the plant in a quart of boiling water. Of this a half teacupful is given every fifteen minutes until the patient vomits thoroughly. He then puts the patient to bed and continues the remedy in smaller doses at lengthened intervals until the patient has perspired for two or three hours, when the medicine is discontinued and tonics are then given.

In conditions due to malaria, where there is intermittent headache, or severe irregular browache, where many of the symptoms of ague are present, this remedy takes precedence over every other.

LYCOPODIUM.**LYCOPODIUM CLAVATUM.**

Synonym—Club-moss.

Part Employed—The spores.

Natural Order—Lycopodiaceæ.

Locality—Europe, Asia, North America.

Botanical Description—Club-moss is a low creeping, green, perennial plant, growing in dry woods; stem branching, two to three feet long, flexible, leafy, woody, slender, tough; branchlets, four to ten, thickly covered with linear owl-shaped, entire, commonly bristle-tipped leaves; branches erect, cord-like, irregularly pinnate; fertile with two or three erect linear spikes, one to two inches long, supported on slender peduncles, four to six inches long; with numerous bracts in the axils of which are the kidney-shaped sporangia containing the sporules. Sporules, a fine pale, yellow powder, not easily wetted with water on account of a superficial oily layer; burning suddenly when thrown into a flame. Under the microscope the spores appear four-sided, the surfaces marked with reticulated ridges, with short projections on the edges. Solvent, alcohol. Dose, from five to ten grains.

Collection—The spikes of the plant are gathered when fully ripe, the spores beaten out and separated from the other parts by a sieve.

CONSTITUENTS—Fixed oil, sugar, volatile base (methylamine), alumina, phosphoric acid.

PREPARATIONS—Specific Lycopodium. Dose, from one to fifteen minims.

Powdered Lycopodium. For external use.

Tincture of Lycopodium. Dose, from one to twenty minims.

The tincture prepared from the triturated sporules contains to the fullest extent the medicinal principles of the herb.

The sporules in themselves constitute an impalpable, unmoistenable powder. The particles of this powder, when examined under a microscope, are found to be about 1/800 of an inch in diameter and shaped like a nut. If this powder be thoroughly triturated in a mortar it will be found that each little particle will be fractured, and will give out a peculiar oleaginous matter which contains the medicinal principle of the plant; hence few have been able to obtain any medicinal virtue from this substance.

Physiological Action—The older writers claimed that the agent acted as a stimulant to the sympathetic visceral system of nerves and influenced the functional activity of all organs so controlled. It was believed to increase the tone of the liver, and to restrain over-action of the kidneys and eliminative organs.

Specific Symptomatology—Extreme sensitiveness of organs of special sense. Pain under the ribs and around the waist;

shooting pains under the shoulder blades; severe pains across the stomach; nausea; vomiting of sour and bitter food; persistent constipation; painful, bleeding piles; coldness of the extremities; pale, ashy or jaundiced complexion, with dirty skin; in some cases of flatulence, with distention of the intestines; persistent constipation of children; irritation of the bowels following an injection; sour stomach and heartburn; in old standing congestions of the liver, with great desire to sleep after eating. All conditions accompanied with excess of uric acid are benefited by it.

Therapy—The simple powder is used extensively as an application to tender and irritable conditions of the skin, and as an application to certain skin diseases to which a dry powder would seem applicable—to **intertrigo**, **erysipelas**, **eczema**, **herpes**, and ulcerated surfaces and perhaps to burns. Its domestic use is in its application to chafed surfaces and as a dusting powder for infants.

The agent is said to be unfailing in its influence upon certain severe forms of **dyspepsia**. That common condition present in catarrhal gastritis, evidenced by soreness on pressure over the stomach, and a sensation of fullness of the stomach when only a little has been eaten, is quickly relieved by its use.

It is advised in **rheumatic** conditions, especially if accompanied by any of the above indications. It is depended upon as a cure for the **uric acid diathesis** and in this probably lies its influence upon rheumatism.

In its action upon the urinary apparatus it relieves **urinary incontinence**, especially if caused by an excess of uric acid and the urates, painful urination and vesical catarrh.

It is also serviceable in gonorrhœa and in gleet.

CROCUS.

CROCUS SATIVUS.

Synonym—Saffron.

Part Employed—The stigmas.

Natural Order—Iridaceæ.

Locality—Asia. Cultivated in Europe.

Botanical Description—Saffron is a perennial herb with a globular cormus an inch thick with white roots beneath, which, in the latter part of summer, puts forth six to nine radical, linear, dark-green, keeled leaves, and in October a lilac-colored flower, arising on a scape six to eight inches from the ground, enveloped by a spathe; perianth four inches long, with six segments one and a half inches long; and a three-cleft convolute stigma an inch long attached to the style; tubular, filiform below, slit on the inner side, with several roundish teeth on the terminal edge; orange color. Dried saffron is flexible, unctuous

to the touch and of an orange-brown color, and when chewed colors the saliva a deep orange-yellow; odor aromatic; taste bitter, aromatic. Solvents, alcohol, water. Dose, from five to thirty grains.

CONSTITUENTS—Crocin, volatile oil, picrocrocine (saffron bitter), gum, wax, fat, albumen.

PREPARATIONS—Tinctura Croci, Tincture of Saffron. Dose, from one to three drams.

Tinctura Serpentariæ Composita, Compound Tincture of Serpentaria. Dose, from ten to sixty minims.

Therapy—Saffron tea was long in good repute among the grandmothers of our older men as an essential remedy to start new-born babes in normal health channels. It was thought necessary to encourage the action of the liver and to cleanse the intestinal canal and stomach. It was positively indicated, probably after the law of *similia*, if the skin was the same color as the tea—yellow—and in **infantile colic**.

It has mild **diaphoretic**, stimulant, **antispasmodic** and tonic properties. It may be given in the early stage of fevers, and especially in **eruptive fevers** in full doses if there is a retrocession of the eruption.

It checks mild cases of irregular **uterine hemorrhage**, menorrhagia or metrorrhagia, and encourages the lochial discharge when suppressed after confinement.

QUASSIA.

QUASSIA AMARA.

Synonym—Simaruba Excelsa.

Part Employed—The wood.

Natural Order—Simarubaceæ.

Locality—Surinam, West Indies.

Botanical Description—A tall, straight tree eighty feet in height, with a smooth, tapering trunk. Bark gray, leaves pointed, oblong on short foot stalks in opposite pairs; flowers in panicles, yellowish-green, small, polygamous, pentandrous; fruit a small black drupe; wood hard, dense, yellow, somewhat porous, exceedingly bitter, odorless.

CONSTITUENTS—Quassin. Dose, one-third of a grain.

PREPARATIONS—Extractum Quassiæ Fluidum, Fluid Extract of Quassia. Dose, from ten minims to one dram. Tinctura Quassiæ, Tincture of Quassia. Dose, from one-half dram to one dram.

Physiological Action—The taste of Quassia is so intensely bitter that with some patients it acts as an emetic at once. It stimulates most positively the salivary, mucous, gastric and intestinal glands and the secretions of the glandular organs, and increases peristaltic action in the intestinal canal. It is an anthelmintic and parasiticide.

Specific Symptomatology—Extreme inactivity of the digestive and assimilating organs from debility—a cessation of function from lack of power, is an indication for the use of this remedy. The evidences are a broad, flabby tongue, pale, thick, indented with the teeth, sometimes heavily furred, coated with a dirty white or brownish coat, mucous membranes of the mouth pale, anorexia, general feebleness.

Therapy—It is one of the best of what is known as “stomach bitters.” In **debility** of the **stomach** or **intestinal** structures, and inactivity of the secreting organs, the tonic effects of this agent are most pronounced. In convalescence from severe acute disease, the conditions there often existing are satisfactorily corrected with this remedy.

Many forms of **dyspepsia** depending purely upon atonicity, are cured by the use of Quassia, either alone or in conjunction with some of the other remedies of this group which possess a similar action.

In the administration of this and other of the pure stomach tonics, if the indications for an acid are present, as shown by deep-red membranes, and a dark, narrow, thin tongue, these agents should be given in conjunction with hydrochloric or nitrohydrochloric acid, or if the indications are those described in the specific symptomatology of this agent, indicating an excess of acids, certain alkaline remedies, as the sodium, potassium or ammonium salts, will increase the influence of these vegetable tonics.

Quassia, by enema, will destroy **ascarides**. **Pin or thread worms** in large quantities may be removed by a single injection of a strong infusion of the bark.

As these worms infest almost the whole of the large intestine, it is advisable for their complete removal that the patient lie on the left side with the hips elevated, and that a large quantity of the infusion, not too strong in this case, but as warm as can be borne, be slowly introduced into the bowel from a fountain syringe. Tonic remedies internally are advised in conjunction if there is a persistent tendency to their reappearance.

Quassia in infusion will destroy small insects, ants, flies and lice of all kinds. The *pediculus capitis* and *pediculus pubis* are readily destroyed by frequent washing with a strong infusion of the drug.

SALIX.**Synonym**—Willow.**Part Employed**—The bark.**Natural Order**—Salicaceæ.**Locality**—Europe.

Botanical Description—The *Salix Alba*, or white willow, which is a native of Europe, and has been introduced into this country, is a large tree, thirty to eighty feet high, with widely spreading branches, a thick bark full of cracks; flowering in July and August; leaves alternate, long-pointed, short-petioled lanceolate, entire or glandular toothed, grayish-green, with silky, silvery hairs underneath; stipules lanceolate; flowers diœcious, in cylindrical catkins, each bract being one-flowered; stamens two; filaments hairy; anthers yellowish; ovary sessile, green, ovate-lanceolate; style short; stigma thick, short, two-parted; capsule ovate, brown, smooth; dried bark in quills, pliable, tough, $\frac{1}{25}$ to $\frac{1}{12}$ inch thick, gray or brownish-yellow; odor slight, taste bitter, astringent. Solvents, alcohol, water. Dose, one dram.

Constituents—Salicin, wax, fat, gum.

Salicin is the active principle of the willow, and crystallizes in silky needles and laminae. It is white, glossy, odorless; partly soluble in water and freely soluble in alcohol, but not in ether or volatile oils. Dose, from two to ten grains.

Therapy—In malarial conditions *Salix Alba* has a direct tonic, antiperiodic and antimalarial influence.

Like the other agents of this class it improves the tone of the gastro-intestinal tracts and the glandular organs. It corrects impaired conditions of all mucous membranes and is thus of value in excessive catarrhal discharges from these membranes, being freely given in **bronchorrhœa**, **gastric catarrh**, **catarrhal diarrhœa** and in **leucorrhœa**, in all cases acting more promptly if malarial conditions have caused the existing debility. It has antiseptic properties, of course, if antimalarial, and is a good remedy in protracted fevers.

It has a mild influence in controlling **passive hemorrhages**, but cannot be depended upon if they are severe.

Its antiseptic properties are apparent in its ability to correct the fetor of wounds and offensive discharges when locally applied.

SUMACH.**RHUS GLABRA.****Synonym**—Smooth Sumach.**Part Employed**—The bark and berries.**Natural Order**—Anacardaceæ.**Locality**—North America.

Botanical Description—Smooth Sumach is an indigenous shrub, growing in rocky and barren soil, flowering in June and

July, and maturing its fruit in September and October; stem twelve feet high, with straggling branches, a large pith and thin circular layer of white wood; bark brownish-gray, covered with warts; leaves imparipinnate; leaflets twenty-one to thirty-one, lance-oblong, serrate, pointed, three inches long, one-fourth inch wide, smooth, shining, whitish beneath, changing to red in autumn; sessile; flowers small, greenish, in dense, ovoid, terminal panicles; fruit a small crimson berry, hanging in clusters, densely hairy, extremely sour to the taste; bark of the root light-gray or reddish externally, yellowish-white internally; taste astringent. Solvent, alcohol; dose, from a half to one dram.

CONSTITUENTS—Volatile oil, resin, tannic and gallic acid, albumen, gum, starch. The berries contain malic acid in combination with lime.

PREPARATIONS—*Extractum Rhois Fluidum* (A. D.), Fluid Extract of Sumach Bark. Dose, from a half to one dram.

Extractum Rhois Glabræ Fluidum (U. S. P.), Fluid Extract of Sumach Berries. Dose, one dram.

Specific Symptomatology—Its influence is upon mucous surfaces in a relaxed, ulcerated and phlegmonous, but irritable and intractable condition.

Therapy—It is used in **aphthous stomatitis**, both internally and externally, in **gangrenous stomatitis** in conjunction with more active agents, and in **stomatitis materni** it is a good remedy. It will serve a good purpose in atonic ulcerations of the stomach and intestinal canal, in some cases of prolonged diarrhoea and dysentery with greatly debilitated mucous surfaces. Its field is well covered, however, with more active remedies.

CORNUS.

CORNUS FLORIDA.

Synonym—Dogwood.

Part Employed—The bark of the root.

Natural Order—Cornaceæ.

Locality—United States.

Botanical Description—*Cornus Florida* is a small tree from twelve to thirty feet high, growing in rocky woods, having a hard, compact wood, and a rough, much broken brownish bark, flowering in April and May; leaves opposite, ovate, acute, four inches long, entire, petiolate, dark-green, becoming crimson in autumn; flowers small, greenish, collected in a close cluster on flower-stalks an inch in length, with four large involucreal leaves of a white color, extraordinarily showy; calyx bell-shaped, with four spreading teeth; corolla with four oblong petals; stamens four; anthers oblong; fruit an oval, bright red drupe arranged in clusters; bark as met with in commerce is in broken fragments, somewhat quilled, one-eighth of an inch thick, two

inches wide, ash-colored with a reddish tinge; the corky layer removed it is reddish-brown, striate, fracture short, of a whitish color, with brown-yellow striae of stone-cells, easily powdered; odor slight; taste astringent, bitter. Solvents, alcohol, water; dose, from twenty to sixty grains.

CONSTITUENTS—Cornin or cornic acid, resin, gallic acid, tannin.

PREPARATIONS—*Extractum Corni Floridae Fluidum*, Fluid Extract of *Cornus Florida*. Dose, from a half to two drams.

Specific Cornus. Dose, from five to sixty minims.

Therapy—This agent is indicated not only to correct the atonic conditions of the glandular structure of the gastrointestinal apparatus in malaria, but as an antidote to the malarial poison itself. It has marked control over many of the manifestations of malaria.

Its influence upon the stomach in these cases increases the appetite at once, improves the character of the digestion and relieves the drowsiness and dullness apt to follow imperfect digestion. It is a tonic in enfeebled conditions of the stomach from whatever cause and improves intestinal digestion.

CHAPTER II.

Mild Stomach Tonics.

FRASERA.

PTELIA.

PIPER NIGRUM.

ALNUS RUBRA.

ASARUM.

PANAX.

SACCHARINUM.

LIATRIS.

CONDURANGO.

ELECAMPANE.

FRASERA.

FRASERA CANADENSIS.

Synonym—American Columbo.

Part Employed—The root.

Natural Order—Gentianaceæ.

Locality—United States.

Botanical Description—*Frasera Canadensis* is a tall biennial plant, growing in rich woodlands in the Middle and Southern States, flowering in June and July; stem dark-purple, erect, smooth, round, four to nine feet high, one or two inches in diameter at the base; leaves in whorls of four or six, decreasing in size as they approach the summit; radical leaves a foot long, oblong-lanceolate; upper, lanceolate and pointed, sessile, deep-green, entire; flowers numerous, yellowish-white, an inch and a quarter in diameter, disposed in a pyramidal panicle from one to five feet long, the branches of which spring from the

axils of the upper leaves; root, which should be gathered in October, fusiform, wrinkled, hard; as found in the shops it is in transverse slices, an inch in diameter, an eighth of an inch thick, with a reddish-brown epidermis, yellow cortex and central medullary matter; taste bitter, sweet. Solvents, alcohol, water. Dose, from twenty to sixty grains.

CONSTITUENTS—Gentiopicroin, gentisic acid, two distinct yellow coloring matters, glucose, gum, sugar, salts.

PREPARATIONS—Specific Fraxera. Dose, from five to thirty minims.

Therapy—This agent operates upon the stomach and digestive apparatus directly, influencing the tone of the glandular organs of the entire digestive tract. It is a stomachic tonic of considerable power, exercising its best influence when the apparatus is impaired by protracted disease. Under these circumstances it is also a stimulant and astringent to the secreting surfaces, correcting **excessive night sweats** common to such a condition, controlling the **diarrhœa** and **dysentery** where there are relaxed and atonic mucous membranes.

In that form of **catarrhal gastritis**, where there is a sense of fullness in the stomach after eating even a little food, it improves the digestion and relieves the distress, and where there is marked debility improves the tone of all the organs.

PTELIA.

PTELIA TRIFOLIATA.

Synonym—Wafer Ash.

Part Employed—The bark of the root.

Natural Order—Rutaceæ.

Locality—United States.

Botanical Description—Wafer Ash is a shrub from six to eight feet high, with dark-brown branches, growing abundantly west of the Alleghanies in shady, moist places, flowering in June; leaves trifoliate, alternate, petiolate, light-green; leaflets sessile, ovate, short, acuminate, indistinctly serrate, finely pellucid-punctate, downy beneath when young, terminal ones cuneate at the base, three to four and a half inches long, one and a fourth to one and three-fourth inches wide; flowers small, greenish-white, polygamous, in compound terminal cymes; stamens four, style short; fruit flat, orbicular, two-celled, four-fifths of an inch in diameter, winged all round; bark when dried, light-brown, in fragments and irregular quills, longitudinally wrinkled, light, smooth on under surface; fracture short; taste bitter, pungent. Solvents, alcohol, water partially. Dose, from ten to thirty grains.

CONSTITUENTS—Oleoresin, starch, albumen, yellow coloring matter, berberin, volatile oil, salt of lime, potash and iron.

PREPARATIONS—Specific Ptelia. Dose, from one to twenty minims.

Therapy—The agent is a mild tonic, exercising a direct influence upon the stomach and digestive apparatus, correcting certain faults of gastric secretion, overcoming dyspepsia and improving the appetite. It may be given to good advantage with other stomachic tonics and iron. It corrects atonic diarrhoea and is of benefit in dysentery, its pungent properties and sufficient astringency renders it of benefit in mild cases. In full doses it acts upon the skin as a diaphoretic. It has been given in lung troubles, but we have other active remedies which produce more gratifying results.

PIPER.

PIPER NIGRUM.

Synonym—Black Pepper.

Part Employed—The unripe berries.

Natural Order—Piperaceæ.

Locality—India, East and West Indies.

Botanical Description—Black Pepper is a trailing or climbing perennial plant indigenous to India and cultivated in other tropical countries; stem twenty to thirty feet long, round, smooth, woody, articulated, swelling at the joints, where radicals are thrown out which adhere like the ivy to other objects; leaves entire, four to six inches long, coriaceous, dark-green, broad-ovate, acute at both ends; petiole half an inch long, glossy above, paler beneath; five to seven-nerved flowers, whitish, small, in spikes opposite the leaves, three to six inches long, slender, drooping; fruit ripening irregularly all the year round, one-sixth of an inch in diameter, berry-like, first green, then red, afterwards black, covered with a pulp; when dried, reticulately wrinkled on the surface, blackish-brown externally, lighter internally; the sarcocarp inclosing a single globular seed, whitish, mealy, containing undeveloped embryo; odor aromatic; taste pungent. Solvents, alcohol, water partially. Dose, from five to fifteen grains.

CONSTITUENTS—Piperin, volatile oil, piperidine, chavicine, starch, gum.

PREPARATIONS—Oleoresina Piperis, Oleoresin of Pepper. Dose, from one-half to two minims. Unguentum Piperis Nigri, Ointment of Black Pepper.

Therapy—The agent fulfills many of the indications of capicum, but is not as efficient a remedy. In strong infusion it is both a local and a slowly diffusible stimulant. It stimulates the stomach and assists in overcoming congestion of that organ and of the bowels. It is valuable in malarial neighborhoods,

overcoming the depressing influence of malaria, but it has no power to destroy the malarial poison.

It is emmenagogue to a mild extent, acting as mustard or ginger does in strong, hot infusion, stimulating gencra' secretion.

ALNUS.

ALNUS RUBRA.

Synonym—Tag Alder.

Part Employed—The bark.

Natural Order—Betulaceæ.

Locality—United States.

Botanical Description—*Alnus Rubra* is a shrub with numerous rather straight stems from six to fifteen feet high, forming clumps on the borders of ponds, flowering in March and April; leaves obovate, acuminate, smooth, green, strongly veined, hairy beneath, two to four inches long, about three-fourths of an inch to an inch wide; petioles long; flowers reddish-green, clustered in catkins, long, slender, pendulous at the end of the branches, fertile ones short, dark-brown, ovoid-oblong; stamens four; fruit ovate; bark inodorous; taste bitter, astringent. Solvents, alcohol, boiling water. Dose, from fifteen to thirty grains.

CONSTITUENTS—Not analyzed.

PREPARATIONS—Specific *Alnus*. Dose, from one to sixty minims.

Therapy—This agent combines both alterative and tonic astringent properties. It removes waste products, improves the tone of mucous structures and increases the secretory action of the glands of these structures. At the same time it prevents the flow of an excessive quantity of mucous into the stomach, and stimulates the flow of gastric juice and aids the digestion. It cures various forms of ulcerations in the mouth, or in the gastro-intestinal canal. It is advised in **rhus poisoning**. It has accomplished satisfactory cures in pustular and eczematous disease of the skin.

ASARUM.

ASARUM CANADENSE.

Synonym—Wild Ginger.

Part Employed—The rhizome and rootlets.

Natural Order—Aristolochiaceæ.

Locality—United States.

Botanical Description—Wild Ginger is a perennial plant, growing in rich woodlands in the eastern portion of the United States and in Canada, flowering in May and June; stem short, forked, from which rise two reniform, downy leaves on petioles six or eight inches long; flowers solitary, rising from the fork of

the stem on a long, hairy, pendulous peduncle; calyx woolly, with three dull purplish leaflets; petals reduced to nectaries; fruit capsule, six-celled; rhizome of the shops six inches long.

Therapy—The stimulant properties of this agent are of a local character, acting directly upon the mucous lining of the intestinal tract, and overcoming flatulence. It is also a stimulant to the secretory function of the skin, acting as a mild but efficient diaphoretic.

It is a stimulant to the muscular structure of the womb and to the ovaries, and is **abortive** and an **active parturient**, and may be given to good advantage in recent cases of **amenorrhœa** from cold.

In inflammatory conditions it should be avoided, but after the inflammation has abated, it will mildly stimulate the function of digestion and food appropriation. We have better remedies. Dose of the tincture, from one-half to one dram.

PANAX.

PANAX QUINQUEFOLIUM.

Synonym—Ginseng.

Part Employed—The root.

Natural Order—Araliaceæ.

Locality—United States.

Botanical Description—*Panax Quinquifolium*, is a perennial indigenous herb, growing in rich soil and in woodlands from New England to Minnesota and south to Georgia, flowering in July; stem round, smooth, green or reddish, one foot high, divided at the summit into three petioles, each supporting a compound leaf, with from three to seven long-petioled leaflets; leaflets obovate, serrate, acute, smooth on both sides, hirsute on the veins above, dark green; flowers greenish-white, in a terminal subglobular umbel, on a long, round, slender peduncle which rises from the center of the petioles; fruit a reniform, scarlet, two-celled, two-seeded berry; root fusiform, two to five inches long, half an inch thick, fleshy, annulate, with a round head above and several branches below, brownish-yellow, internally white, fracture short, mealy; bark thick, with many brown-red resin cells separated from the yellowish woody substance by a brown cambium line; odor faint; taste sweetish, bitter, aromatic. Solvents, alcohol, water. Dose, from ten to sixty grains.

CONSTITUENTS—Panaquilon, gum, resin, starch, albumen.

PREPARATIONS—Specific Panas. Dose, from five to sixty minims.

Therapy—This agent is an important article of commerce in China, being a general domestic remedy and highly prized. It is a mild sedative and tonic to the nerve centers, **improving**

their **tone**, if persisted in, and increasing the capillary **circulation** of the **brain**. It is given in **cerebral anæmia**, and if combined with other tonics is capable of doing some good. It is also prescribed in the failure of **digestion** incident to **nervous prostration** and general nerve irritation.

LIATRIS.

Synonym—Gay Feather, Colic Root.

Part Employed—The root.

Natural Order—Compositæ.

Locality—United States.

Botanical Description—This plant grows in moist soil throughout the northern and eastern portions of the United States. It is a perennial with a tall, erect stem fourteen feet high, with a terminal spike bearing about thirty florets; flowers compound, purple; flowers in August; rhizome long, tuberous, with a pungent, bitter taste, terebinthinate; odor aromatic-balsamic. Soluble in water and alcohol.

PREPARATIONS—Extractum Liatris Fluidum, Fluid Extract of Liatris. Dose, from one-half dram to one dram.

Specific Liatris. Dose, from ten to sixty minims.

Infusion Liatris. Dose, from one to four drams.

Physiological Action—The agent has the properties, to a mild degree, of a bitter tonic. It is said to act as an antispasmodic to spasm of the muscular structure of the intestines, relieving spasmodic colic. It stimulates the kidneys and has been used in dropsies. It may be used in the latter stages of fevers as an eliminant.

Therapy—Liatris stimulates the stomach mildly, and is a tonic and antispasmodic to the entire gastro-intestinal apparatus, relieving colic and soothing irritation. After fevers and other acute prostrating diseases it is a useful remedy to assist in removing the products of disease and restoring healthy glandular action. Its eliminative action is quite marked, it having been often used in syphilis and scrofula.

It is a prompt diuretic, relieving kidney irritation and assisting in the removal of dropsical effusions, but we have more direct and efficient remedies.

CONDURANGO.**GONOLOBUS CONDURANGO.**

Synonyms—Cundurango (Cundur-angu, vine of Condor).

Part Employed—The bark.

Natural Order—Asclepiadaceæ.

Locality—Ecuador.

Botanical Description—Condurango, or the Condor vine, is

a twining, climbing vine, from ten to thirty feet long, with small furrowed branches. It resembles the grape vine of the temperate zones. It has opposite cordate leaves, with few-flowered inflorescence; calyx and corolla five-parted, limb wheel-shaped, lobes convolute in the bud, seeds comose.

PREPARATIONS—*Extractum Conduragonis Fluidum*, Fluid Extract Condurango, not miscible with water without precipitation. Dose, one-half to one fluid dram.

Therapy—The influence of the agent is exercised directly upon the stomach as a tonic and corrective of perverted action. It is of service in **gastric ulcer** and in the early stages of cancer of the stomach, for which it was originally lauded as a cure. It is depended upon by some enthusiastic users to retard progress of some cases of this disease, and to relieve distress and urgent symptoms when fully developed. It cannot be curative. It will be found of service, probably, in catarrhal gastritis, with extreme atonicity and threatened ulceration. In these cases its virtues as a tonic and restorative will find exercise to the full extent of their influence.

It deserves thorough investigation and faithful trial. It may be given in the form of a warm decoction with excellent advantage. A wine of Condurango is prepared which has good influence upon the stomach. Half an ounce may be taken with the meals.

INULA.

INULA HELENIUM.

Synonym—Elecampane.

Part Employed—The recent root.

Natural Order—Compositæ.

Locality—Europe, Central and Northern, and North America, Asia.

Botanical Description—A perennial plant from three to five feet high, growing in low, damp soil; stem solid, furrowed, villos, leafy; leaves dark-green on upper surface, downy beneath, large, ovate, serrate; decurrent radicals on long petioles; flowers large, yellow, terminal, with loose imbricated involucre, flowering in July and August; florets five-toothed, linear; seeds quadrangular, striated. The root usually seen dried, thick, yellowish-gray in concave slices or longitudinal sections; bark wrinkled and brown externally, fracture short, brittle; odor aromatic characteristic; taste bitter, pungent.

CONSTITUENTS—Helenin, inulin, volatile oil, acrid resin, bitter extractive.

PREPARATIONS—*Extractum Inulæ Fluidum*, Fluid Extract of Elecampane. Dose, from ten to sixty minims.

Specific Inula. Dose, from five to forty minims.

Administration—The agent is given in infusion to excellent

advantage, and a syrup may be prepared which is serviceable in lung troubles.

Helenin is given in doses of from the $\frac{1}{12}$ to the $\frac{1}{4}$ of a grain four or five times daily.

Physiological Action—The tonic influence of this agent has been recognized for many years. It acts directly upon the nutritive functions of the body. In general debility from protracted disease, or from overwork, or from age, its influence is plainly apparent. It imparts tone to the digestive and respiratory organs and to the urinary tract.

The extractive principle, helenin, is said to be destructive to the bacillus tuberculosis, streptococcus erysipclatis and pyogenes, the bacillus typhosus and other disease germs, and has been used with pronounced results in conditions of which those germs were the cause.

Therapy—In atonic condition of the abdominal viscera, with engorgement, great relaxation and general inactivity, this agent exercises specific properties. It influences not only the character of the circulation, but acts also as an alterative, improving the character of the blood. It is of advantage in those atonic conditions where, with great inactivity of the gastro-intestinal tracts, there is disorder of the skin with discoloration and eruptions.

The direct tonic influence of Inula seems to be exercised also upon the **respiratory tract** after protracted disease, promoting recovery. It lessens excessive bronchial secretion, controls the **night sweats** and imparts real tone and strength.

Excessive **catarrhal discharges** from the bladder are readily controlled by its use, and vaginal catarrh yields readily to its influence. It acts directly upon the glands of the cervix uteri, and in catarrhal endometritis it speedily overcomes the glairy mucous discharge and materially improves the condition.

SACCHARINUM.

Formula— $C_7H_5SO_3N$.

Synonyms—Saccharin, Hydro-orthosulphaminbenzoic acid.

Description—Saccharin occurs in the form of a white, irregular crystalline powder, with an acid reaction, soluble in 500 parts of distilled water, but dissolving readily in boiling water, from which it crystallizes on cooling. It is readily soluble in alcohol and ether, and forms soluble salts with the hydrates or carbonates of the alkaline metals, which separate from their solutions on the addition of acids. When fused with potassic hydrate it forms salicylic acid. It has an intensely sweet taste. One part dissolved and neutralized in 70,000 parts of water can be tasted. It is 300 times sweeter than sugar. Its taste closely

resembles the taste of cane-sugar, with a peculiar by-taste like bitter almonds.

Physiological Action—Saccharin has no toxic influence on the animal body; when given internally or subcutaneously, is excreted completely by the kidneys in unaltered state. It is therefore not decomposed in the body, nor do the saliva or the fæces contain any traces even after large doses. Unlike benzoic and salicylic acid, it is not converted into hippuric or salicyluric acid. It has scarcely any retarding effect on the digestion of either proteids or hydrocarbons, and in fact it is said to increase the diastatic action of malt. When given in large doses, however fifty to seventy-five grains, injurious effects or disturbances of the appetite are sometimes induced. The urine is usually not altered either in specific gravity, quantity, or in the amount of urea and uric acid; it, however, does not readily undergo fermentation. The amount of chlorides in the urine appear to be increased during its use, while the phosphates remain normal. Animals on full diet with the addition of Saccharin increase in weight.

Therapy—It is given to replace sugar when that agent should be avoided. **Diabetic patients** use it freely for sweetening their food and beverages, and in most cases are as well satisfied with it as with sugar. Five grains will sweeten a cup of coffee as effectually as two teaspoonfuls of sugar. It sweetens sauces and fruits however acid they may be without chemical change.

It is used in the treatment of **obesity**, but its utility in this condition is questionable.

In certain forms of **acid dyspepsia** it has exercised a mild curative influence.

It conceals the bitter taste of quinine and bitter tonics much more effectually than sugar.

CHAPTER III.

Agents Used in the Relief of Gastric and Intestinal Pain—Gastro-Intestinal Sedatives.

DIOSCOREA.

COLOCYNTH.

GINGER.

PEPPERMINT.

HORSEMINT.

DIOSCOREA.

DIOSCOREA VILLOSA.

Synonym—Wild Yam.

Part Employed—The rhizome.

Natural Order—Dioscoreaceæ.

Locality—United States.

Botanical Description—*Dioscorea Villosa* is a perennial plant, with a delicate twining vine, stem one to two lines in diameter, smooth, woody, reddish-brown, five to fifteen feet

long; leaves alternate, opposite or whorled, two to four inches long, broadly ovate-cordate, acuminate, nine to eleven-veined, nearly smooth above, downy and pale beneath; flowers dioecious, small, greenish-yellow, in axillary racemes; fruit in triangular winged capsules, in pendulous bunches; root long, branching, contorted, fibrous, ligneous, horizontal, about half an inch thick on the lower side, with distinct wiry rootlets, two to four inches long; rhizome pale yellowish-brown externally, white within; taste acrid. Dose, from one to five grains.

CONSTITUENTS—Saponin.

PREPARATIONS—Dioscorein. Dose, from one to four grains.

Specific Dioscorea. Dose, from one to forty minims.

Physiological Action—Antispasmodic and anodyne.

Specific Symptomatology—In sudden spasmodic **gripping** pain in the stomach and bowels it acts similarly to colocynth, but is more certain in the severer cases, especially if from malarial causes. It is specific in **bilious colic**—in the pain of the passing of **gall stones**, in mild cases, and is valuable in spasmodic colic of any kind. Spasmodic pain yields to it readily, but it is much more certain in pain and muscular spasm of the intestines. Its action produces either immediate or negative results. If, therefore, there is no benefit after one or two hours' use it may be discontinued.

Therapy—In the spasmodic pain of cholera morbus or cholera infantum, of diarrhœa or dysentery it is useful.

In **neuralgic dysmenorrhœa**, in **ovarian neuralgia**, in **cramp-like pains** in the uterus at any time and in severe **after pains** it often acts satisfactorily, quickly relieving the muscular spasm. Fifteen drops of the tincture of the specific Dioscorea in half a teacupful of hot water should be drunk at a single dose, as in acute cases it is much more certain if given in this manner. Five drops every hour or two can be given with good results in constantly recurring mild **colicky pains** without apparent cause. When given for after pains it is usually best to give the tincture in ten drop doses in cold water every half hour or hour, as the hot infusion may cause too great relaxation of the uterine muscular structure, and permit severe hemorrhage.

COLOCYNTHIS.

CITRULLUS COLOCYNTHIS.

Synonym—Colocynth.

Part Employed—The dried peeled fruit, freed from seeds.

Natural Order—Cucurbitaceæ.

Locality—Asia, Africa.

Botanical Description—The Colocynth plant resembles the watermelon, being an annual plant with a prostrate, angular, hispid stem, and numerous tendrils, with which the vine climbs;

root perennial; leaves many, one to four inches long, lobed, hairy, cordate, alternate, ovate, on long hispid petioles, variously sinuated, green above, paler below; flowers yellow, axillary, large, monœcious, both kinds similar, solitary; petals small; fruit globose, two to four inches in diameter, smooth, size of an orange, yellow when ripe, with a thin rind, inside spongy and when dry breaking into three wedge-shaped pieces, with numerous flat ovate brown seeds, borne on the incurved ends of the placenta. The pulp, the rind and seeds being removed, is used in medicine. As found in commerce, *Colocynthis* is in the shape of whitish balls about the size of an orange, very light and spongy, and abounding in seeds. The pulp has a feeble odor and a nauseous and intensely bitter taste. Solvents, alcohol, water. Dose, from one-half to five grains.

CONSTITUENTS—*Colocynthin*, extractive, fixed oil, resin, gum, pectin, calcium and magnesium phosphate.

PREPARATIONS—*Extractum Colocynthis*, *Extract of Colocynthis*. Dose, from one-half to two grains.

Extractum Colocynthis Compositum, *Compound Extract of Colocynthis*. Dose, from five to twenty grains.

Specific Colocynthis. Dose, from one-twentieth to three minims.

Physiological Action—Hydragogue cathartic, tonic. In excessive doses it causes violent emesis, catharsis, bloody stools, severe burning colicky pains, spasms, and in some cases death.

Specific Symptomatology—Acute, cutting pains in the stomach and bowels in infants—in otherwise perfect health. Intestinal derangements denoted by screams and sharp crying out in sleep, persistent crying and screaming with drawing up of the legs in very young babes. Spasmodic pain of all kinds in the stomach or bowels.

Therapy—Five drops of the tincture in half of a glass of water, a teaspoonful every fifteen minutes, will cure **infantile colic** with the above symptoms in an hour. It is serviceable in all forms of colic in these small doses, whether from the liver, stomach or the intestines, if the pain is sharp, quick and of a cutting character. It will cure neuralgic colic wherever located, and also some cases of idiopathic neuralgia.

In large doses it is **cathartic** and depressant in its action, slowing the heart and reducing the temperature and at the same time producing great irritation, consequently feebleness and inflammation are contraindications to its use.

In **bilious dyspepsia**, so-called, with distention or a feeling of fullness in the stomach after eating, it is a good remedy in minute doses given after meals. The tincture is a better remedy than the specific, as the latter is too active, it is a good plan to dilute it for every day prescribing, in the pro-

portion of one dram to nine drams of dilute alcohol. Of this ten minims in a four ounce mixture will produce excellent results.

ZINGIBER.

Synonym—Ginger.

Part Employed—The rhizome.

Natural Order—Scitamineæ.

Locality—India.

Botanical Description—The Ginger plant is a perennial herb, indigenous to tropical Asia and now cultivated in other tropical countries; stem annual, erect, barren, oblique, round, leafy, about forty inches high, invested by the leaf-sheaths; leaves six to twelve inches long, one to one and a half inches wide, alternate, lanceolate, subsessile, glabrous, bifarious, acute; flowers yellowish-white; scape radical, solitary, six to twelve inches long, terminating in a spike.

In commerce there are two kinds of Ginger, one white and the other black, due to different methods of preparing the root. The better is light-colored, compact, heavy, of a strong odor and a burning taste. The rhizome is two to four inches long, half an inch broad, one-third of an inch thick, with flattened, clavate branches somewhat palmately lobed, with a stem-scar at the end of each lobe; deprived of corky layer it is of a yellowish-brown color, wrinkled, annulate; uncoated it is of a pale-buff color, striated, nearly smooth externally, fracture mealy, fibrous, yellowish, with many scattered resin cells and fibro-vascular bundles, the latter inclosed by a nucleus sheath; odor aromatic; taste pungent, hot. Solvents, alcohol, water partially. Dose, from ten to thirty grains.

CONSTITUENTS—Volatile oil, resin, starch, gum, gingerol.

PREPARATIONS—Extractum Zingiberis Fluidum, Fluid Extract of Ginger. Dose, from ten to thirty minims. Oleoresin Zingiberis, Oleoresin of Ginger. Dose, from a half to one minim.

Tinctura Zingiberis, Tincture of Ginger. Dose, from fifteen to sixty minims, diluted with water.

Infusum Zingiberis, Infusion of Ginger, prepared by adding a teaspoonful of powdered ginger to half a pint of hot water. Drunk at once, it acts as an emetic and diaphoretic.

Physiological Action—This agent is mentioned in but few therapeutic works, although it occupies an important place, and should not be neglected. It is a profound and immediate stimulant, an active diaphoretic, an anodyne in gastric and intestinal pain, and a sedative to an irritated and overwrought system when there is extreme exhaustion. An infusion of the

ZINGIBER OFFICINALE.

powder drunk warm produces immediate but mild emesis and active diaphoresis.

Therapy—Ginger is an emergency remedy. In every case in which brandy or whisky is given to produce an immediate stimulating influence, the tincture of ginger can be given with even better results. From half a teaspoonful to a teaspoonful will produce greater stimulation than half an ounce of brandy. It may be stirred into half a glass of cold water, but is much more immediate in its action if given in hot water. The tincture does not produce emesis.

The agent stimulates the stomach actively, producing a pleasing sense of warmth. It overcomes flatulence and quickly relieves **flatulent colic**. In **atonic conditions** of the **stomach** and intestinal tract, it stimulates the structure to renewed activity and materially assists in the restoration of normal tone. It relieves pain from any cause except inflammatory action, when this remedy must be avoided.

In **acute colds** the entire train of symptoms may be aborted in a single night, by advising the patient to take a hot mustard foot bath at bedtime, while the body, prepared for bed, is wrapped in warm blankets. During the foot bath, which should last twenty minutes, the patient should slowly drink a half pint of hot water into which is stirred a dram of the tincture of Ginger. After the foot bath the patient should get into a warm bed, still wrapped in the blankets, and allow the sweating thus induced to continue for from half an hour to an hour, slowly and carefully divesting himself of the excess of clothing, until the perspiration subsides. Acute inflammations may be aborted by this course. In **dysmenorrhœa**, **ovarian neuralgia** and **uterine pain** from any cause at the menstrual epoch, this agent is reliable. If given at the beginning of an **hysterical attack** it will often abort the attack, and produce quiet and restful sleep.

Its influence as a rubifacient is slow and by no means as satisfactory as mustard, and it is now seldom used as a counter-irritant.

MENTHA.

MENTHA PIPERITA.

Synonym—Peppermint.

Part Employed—The leaves and tops.

Natural Order—Labiatae.

Locality—Asia, Europe, North America.

Botanical Description—Peppermint is a perennial herbaceous plant, with a creeping root-stalk by which it readily multiplies, and is found growing in moist places, flowering from June to September; stem two to three feet high, square, chan-

neled, purplish, pubescent, branched towards the top; leaves opposite, ovate-oblong, lanceolate, rounded at the base, serrate, acute, nearly smooth, dark-green, glandular, two to three inches long; flowers small, purple, in whorls, uppermost in a short, oblong, obtuse reddish spike, below interrupted and arranged in cymes; calyx five-toothed; corolla tubular, purplish; stamens four; anthers with two parallel cells; achenia smooth.

The plant should be gathered in dry weather in August and September while blooming. It has a strong aromatic odor and a pungent, cooling taste. Solvents, alcohol, water partially. Dose, from fifteen to sixty grains.

CONSTITUENTS—Volatile oil, resin, tannin, gum.

PREPARATIONS—Aqua Menthæ Piperitæ, Peppermint Water. Dose, *ad libitum*.

Olium Menthæ Piperitæ, Oil of Peppermint. This is a volatile oil prepared from the fresh herb by distillation with steam, and is a greenish-yellow liquid, having a pungent odor and taste. Dose, from one to fifteen minims.

Physiological Action—Peppermint is a powerful diffusible stimulant, carminative, antispasmodic, stomachic, and in the form of the volatile oil a local anæsthetic.

Specific Symptomatology—Flatulent colic, gastrodynia, nausea, vomiting, spasmodic pain in the bowels, hiccough, palpitation from indigestion, griping, cholera morbus, cholera infantum, spasmodic cholera, irritability of the stomach, diarrhœa with abdominal pain, nervous headache, painful gonorrhœa.

Therapy—In fevers of an inflammatory character caused by exposure to cold and damp, with nausea and vomiting, a warm infusion of peppermint may be given to produce perspiration and promote a cure, as it is a very efficient diaphoretic.

The oil of peppermint, on account of the menthol present in it, is a local anæsthetic, and may be employed to relieve local pain, as in the inflamed joints of **rheumatism**, as a spray in painful inflammation of the throat and fauces, and in any painful condition where a direct application of the anæsthetic can be made.

Where the food tends to ferment in the stomach and bowels, it may be given in doses of three to five minims in capsules, as an antiseptic to prevent fermentation and promote digestion.

When a local application of the oil of peppermint is made, the parts, where practicable, should be covered with oiled silk or rubber cloth to prevent evaporation.

A spray of oil of peppermint may be inhaled with relief of many of the distressing symptoms incident to asthma and chronic bronchitis of the aged.

Oil of peppermint applied to carious teeth will promptly relieve the pain of **toothache**. The cavity should be dried and a pledget of cotton saturated with the oil placed in it.

In the extreme irritability of the stomach in **cholera morbus** and in painful stasis of the stomach and bowels, the spirit of peppermint may be given at frequent intervals in hot, sweetened water, while hot fomentations should be applied to the abdomen at the same time.

In the pain of **acute indigestion**, and in painful diarrhœa and dysentery, while peppermint will prove a valuable analgesic, it is more important to the safety of the patient to empty the stomach with an emetic of the compound powder of lobelia, or move the bowels with a cathartic of sulphate of soda; when the cause is removed the pain and danger will pass away.

In burns and scalds peppermint is both soothing and curative, the parts being kept wet with it. It is a stimulating dressing, but is not objectionable on this account.

In **rectal pruritus**, and in painful papillary growths at the orifice of the female urethra, either the oil of peppermint or Menthol may be employed as a local anæsthetic to relieve the itching and pain.

In painful bowel complaints with inflammation—pain on pressure, tongue dry, with reddened tip and edges, peppermint should not be given. In any case if the remedy does not afford relief in a reasonable time it should be discontinued.

MONARDA.

MONARDA PUNCTATA.

Synonym—Horsemint.

Part Employed—The leaves and flowers.

Natural Order—Labiata.

Locality—United States.

Botanical Description—The plant grows from twelve to fourteen inches in height, is perennial; leaves two inches long, lanceolate, acutely serrated, smooth above, glandular below, in axillary whorls, ten-flowered cymules, eight bracts, entire, leafy, sessile, from light-yellow to purple in color; calyx tubular, downy, five-toothed; corolla prominent, upper lip arched, yellowish, with purple spots, lower lip three-lobed; two stamens; odor fragrant, aromatic; taste pungent, bitterish, permanent.

Constituents—A dark-yellow volatile oil which contains thymol. Soluble in alcohol. Dose, from one to five drops.

Physiological Action—In its general influence *Monarda punctata* is a pure active stimulant of a diffusible character; a few drops of the oil on the tongue will produce a stimulation which will be felt at the tips of the fingers in a few minutes. It stimulates the nervous system and increases the heart's action, taking the place of alcoholic stimulants to a great extent. The essence, tincture or infusion are all prompt in their action.

It soothes nervous excitement when due to exhaustion, promoting sleep and rest.

Upon the stomach, in whatever form taken, it is a stimulant tonic and carminative. It soothes gastric and intestinal pain in the absence of inflammation, and overcomes nausea and vomiting. It controls diarrhœa from debility with relaxation of the mucous structures of the intestinal canal.

Therapy—The agent is efficient in the control of **vomiting** due to exhaustion, or persistent nausea with flatulence present in dilated stomach, or the vomiting of alcoholics, in whom it will, in part, supply the craving for liquor, and impart a temporary tone to the stomach and nervous system. It may be given with turpentine or gaultheria in extreme atonicity of the intestinal tract in protracted fevers with tympanites. It is to some extent a diaphoretic, and has also a diuretic action which is important in these fevers.

The agent has been used to considerable extent as an emmenagogue, and is sometimes efficient in simple retention of the menses from cold.

Note—As sedatives to nausea and gastric irritation, other agents, as hydrocyanic acid, ingluvin, ferrocyanide of iron, and ipecac in small doses, are very efficient, and this property is fully described in the consideration of the therapy of those agents in other chapters.

CHAPTER IV.

Agents Used as Sedatives to Gastric Irritation—Anti-Emetics.

AMYGDALUS PERSICA.

BISMUTH SUBNITRATE.

BISMUTH SUB-GALLATE.

OXALATE OF CERIUM.

ARSENIC OXIDE.

AMYGDALUS.

AMYGDALUS PERSICA.

Synonym—The Peach Tree.

Part Employed—The leaves and bark of the young twigs.

Natural Order—Rosaceæ.

Location—Temperate climates, Europe, America and Asia.

Botanical Description—A shrubby tree, from fifteen to twenty-five feet high, with numerous small spreading branches; leaves three to four inches long, three-fourths of an inch wide, elliptical, sharply pointed, minutely serrated; color, bright green above, lighter beneath; flowers in five petals, from white to pink, or rose colored; fruit edible.

PREPARATIONS—Tincture Amygdalus Persica. Dose, from ten to sixty minims.

Specific Amygdalus. Dose, from five to thirty minims.

Therapy—The older physicians suggested this remedy as specific to irritation in the stomach, with **persistent nausea** and **vomiting**, especially valuable in childhood where the tongue was elongated and pointed, the edges red and the stomach tender on pressure. It has invariably disappointed the author, but other physicians use it with much confidence. It is said to relieve **nervous vomiting** and the **vomiting of pregnancy**, and the persistent vomiting of **cholera infantum**. It is sometimes best given in strong infusion of the bark of the green twigs.

BISMUTH SUBNITRATE.

Occurrence—Subnitrate of Bismuth.

This salt is formed from purified Bismuth, by the action of nitric acid in the presence of distilled water.

Description—It occurs as a heavy, white powder, odorless and nearly tasteless. Permanent in character and insoluble in water and alcohol. In its chemical character it is not invariable. Dose, from three to fifteen grains.

Physiological Action—It is a mild and soothing agent in its local influence upon the skin and inflamed mucous surfaces. Internally its influence is confined almost exclusively to the gastro-intestinal mucous membranes.

The agent is not entirely devoid of toxic properties, when applied very extensively to large, open wounds. It sometimes produces poisonous effects owing to a not uncommon adulteration with a salt of arsenic. It has produced gastro-intestinal irritation and symptoms of arsenic poisoning. Desquamative nephritis with albuminous urine has occurred from its free and long continued use.

In all cases where its use is persisted in, it produces a greenish or black discoloration of the bowels, and an odor of garlic upon the breath which is due partly to decomposition of the salt and partly to the presence of tellurium.

Therapy—It is applicable in all cases of vomiting from local irritation. It has long been in use for this purpose. It is one of the best known remedies in **chronic catarrh** of the **stomach** with much nausea and the secretion of large quantities of mucus. The writer has used an arbitrary combination of this salt with an equal part of ingluvin in all cases of irritation of the stomach. The combination is much more serviceable than either agent alone, and is applicable to very many conditions, particularly to the **summer complaints** of children with extreme and persistent nausea.

In these cases it is well to add half a teaspoonful of this powder to half a glass of water, and after thoroughly stirring it, to administer a teaspoonful every few minutes for an hour or two, all other remedies being suspended. When the irritation is controlled, the agent should be continued for a short time in alternation with other necessary remedies.

Its influence is not confined to the stomach alone, but extends to the intestinal mucous surface, where it materially assists in controlling many forms of **diarrhœa** through the astringent properties of the Bismuth.

In the use of Bismuth Subnitrate for the cure of chronic gastric catarrh, large doses are necessary. Fifteen grains of the pure salt, given once in three or four hours, is of more service than five grains often repeated.

It is useful also in **pyrosis**, in gastric **flatulence** and in extreme **acidity** of the **stomach** especially from the presence of lactic and butyric acids.

In **diarrhœas**, where extreme relaxation is present with lack of tone in the intestinal membranes, this agent is of but little value as it lacks tonic properties.

As an **external application**, Bismuth is one of the most valuable remedies. It forms a most perfect dusting powder for all **chafings** and **excoriations** especially in young infants. It is applicable also to the skin of the face when easily chapped or when sensitive from shaving, and to chapped hands.

Incorporated in an ointment of lanolin, it is excellent applied to cracked and fissured nipples. It should be kept constantly applied, any excess being wiped off before nursing, and the ointment fully reapplied afterward.

This ointment is most superior as an application to **superficial burns**. After the pain and heat is reduced by the application of a carbonate, if this ointment is kept constantly applied to the burned surface, the healing is very rapid and the cicatrix is in some cases scarcely perceptible, usually no contraction of tissue taking place.

Although antiseptic properties are not ascribed to the remedy, pus is not likely to form when it is used. Where an active antiseptic is needed, boric acid may be incorporated with it. An ointment of this character is applicable to **eczema** of the moist variety. If applied, and the surface closely covered, healing in some cases takes place with great rapidity. In **eczema** of the **scrotum** and **anus**, this agent is applicable, and in **piles** of an acute or sub-acute character, it renders excellent service. It is applicable to **fissures** of the anus and to **ulcerated conditions** within the **rectum**, especially if there are offensive and irritating discharges.

BISMUTH SUB-GALLATE.

Synonyms—Sub-Gallate of Bismuth. Dermatol.

Description—The method of the preparation of this substance, of which the name **Dermatol** is proprietary, is not given. It contains fifty-five per cent of the oxide of Bismuth. It occurs in the form of a fine dry powder of a saffron-yellow color, without odor, permanent in the air and in the sunlight and insoluble in the usual menstrua.

Specific Symptomatology—Thornton says it is a specific in gastric troubles, usually those of a sub-acute character in which there are a white tongue, acid eructations, feeling of weight in the stomach after meals—bloating, diarrhœal discharges at irregular intervals, general dilatation of vessels.

Therapy—This agent performs the function of the subnitrate in nearly every particular, but is more actively astringent and profoundly antiseptic. Although toxic properties have not yet been observed to any great extent, yet they are undoubtedly present in the agent. In all conditions in which iodoform has been used in surgery, this agent has been substituted with results in most cases equally as satisfactory. It apparently acts in a similar manner, destroying the ptomaines and thus rendering the germ inert. In an ointment with lanolin or with equal parts of lanolin and zinc ointment, in the proportion of one dram of this substance to the ounce, its use is advised in all the cases we have named for the subnitrate. It is most highly praised in its action upon **moist eczema**. In all the cases of gastric and intestinal inflammation, and as an agent to control vomiting, this agent is used in much the same manner as the subnitrate, in doses of from three to ten grains.

CEROUS OXALATE.

Synonym—Oxalate of Cerium.

Occurrence—This salt is obtained by a complex process through the action, first, of sulphuric acid and heat upon the Swedish mineral cerite, which is composed of the silicate of cerium, subsequently adding oxalic acid.

It may also be obtained by the action of the oxalate of ammonium upon any soluble salt of cerium.

Description—The oxalate is a permanent white granular powder without odor or taste; insoluble in water, alcohol, ether or chloroform, but forming a chemical solution with either hydrochloric or sulphuric acid.

Administration—The salt may be given in doses of one grain every three hours. Three grains three times daily may serve the purpose. Eight grains is the maximum dose. It

may be given in pill form or in a capsule. Large doses are sometimes effectual where small doses fail.

Therapy—The agent is a sedative to **gastric irritation**, controlling **vomiting**. Although acting similarly to bismuth subnitrate it has a wider action, through its influence as a nerve sedative, thus being especially advantageous in reflex vomiting. In vomiting of pregnancy it is commonly used; also in the vomiting or nausea present in **hysteria** and in **uterine disorders** and displacements. As a local **gastric** sedative, it is given in **pyrosis**, in **acid dyspepsia**, in **catarrhal gastritis**, especially if there are nervous complications, and in small doses in vomiting of **cholera infantum**.

In the disordered stomach of **chronic wasting diseases**—phthisis, chronic diarrhoeas and chronic nephritis—it is sometimes advantageously used.

That the agent has an influence upon the nerve centers is proven by the fact that it effectually controls some cases of **chorea**, and has been given advantageously in other forms of nerve irritation, and in epilepsy. It must be given in full maximum doses of the pure salt to obtain good results in these cases.

ARSENIC.

ACIDUM ARSENOSUM.

Synonyms—Arsenous acid, Arsenic trioxide, Arsenicum album, white Arsenic.

Occurrence—This substance occurs as a by-product in the roasting of ores which contain elemental Arsenic. The oxide sublimes is collected and resublimed.

Description—A white crystalline solid, ordinarily, but may also exist in an amorphous, vitreous form. It has a sweetish taste, afterwards metallic, acrid and nauseating. It has no odor, is slightly soluble in water, two parts of the crystals dissolving in 1,000 parts of pure cold water, and 87 parts of the crystals in 1,000 parts of boiling water. The solution made with boiling water may be evaporated until the quantity is reduced about one-half, when 166.6 parts of Arsenic will remain in perfect and permanent solution. Dose, from $\frac{1}{100}$ to $\frac{1}{20}$ of a grain.

Physiological Action—In its physiological action this agent is a caustic poison. It acts as an escharotic and local irritant. When a poisonous dose has been taken there is salivation, metallic taste in the mouth, nausea, vomiting, great pain, with diffused soreness and intense burning in the stomach, which radiates from this organ outward throughout the abdomen. It produces irregular heart action, palpitation, feeble pulse, shallow, rapid and oppressed breathing, oedema and albuminuria.

The skin becomes cold and covered with a cold, clammy sweat. Finally, delirium and convulsions occur and are followed by death.

Almost all the phenomena of cholera in extreme cases, are apparent in the symptoms of Arsenic poisoning.

In medicinal doses the agent increases the appetite and digestion, stimulating the intestinal glands to increased secretion and encouraging peristaltic action. It stimulates the function of the brain and the central nervous system, producing a feeling of exaltation and exhilaration. Its tonic influences are quite marked. While power to improve the condition of the blood is attributed to it, the manner in which this improvement occurs is not understood.

Specific Symptomatology—It is especially indicated where there is a general plethoric or engorged condition, or an œdematous condition of the cellular tissues, with a deficiency of normal elasticity. This condition when resulting from malarial influences, or from inactive liver and spleen, is especially susceptible to the action of this remedy.

In its absorption by the stomach, Ringer says if that organ is empty the Arsenic enters the veins and is carried directly to the liver. If there is food in the stomach, the agent is absorbed by the lacteals, and is thence poured into the blood current.

Therapy—In **dyspepsia** from general atonicity of the stomach, Arsenic taken before meals will stimulate this organ, promoting the flow of the digestive fluids, and materially improving its tone. It is a common remedy in the treatment of **gastralgia** and in ulcer of the stomach.

In that form of chronic indigestion which induces a necessity for an immediate evacuation of the bowels, quite common to some debilitated patients and to children, this agent is of specific value. It relieves the increased peristaltic action induced by the presence of food, which is the cause of the food being expelled before it is digested. In these cases the digestion is increased, rapid absorption of the food takes place, and the patient shows an improvement in general nutrition. The agent should be given in small doses before meals, one drop of Fowler's solution being usually sufficient.

In chronic ulceration and **cancer of the stomach** it alleviates the pain and relieves the vomiting. It is useful in all cases of **vomiting**. The vomiting of cholera and of **cholera infantum** are relieved by it.

The **reflex vomiting of pregnancy** and the regurgitation of food, common to neurasthenic and hysterical patients, is sometimes cured with Arsenic when other agents have failed.

It has been highly commended in the treatment of **vomiting of alcoholics**. Given in proper doses in these cases and persisted in it restores the tone of the stomach, improves the digestion

and materially increases the appetite. It is used in the treatment of alcoholism in combination with other measures.

In **membranous dysmenorrhœa** this agent is of much service, and Simpson claims that the agent is specific to that form of **diarrhœa** in women in which with copious evacuations from the bowels, there are shreds and particles of membrane freely discharged, a condition which results in great emaciation and nervous exhaustion.

In the treatment of **cholera**, Arsenic has been experimented with very widely. It has been used both in very large, and in homœopathic doses. In the latter form very much has been claimed from its use. In small or medium doses it will, without doubt, materially assist the cure.

The agent is useful in **jaundice** due to **malaria**, where there is catarrh of the bile ducts, also in overcoming duodenal catarrh. Often repeated doses of Arsenic, not exceeding the $\frac{1}{100}$ of a grain, triturated with sugar of milk, are exceedingly efficacious in some cases of **watery diarrhœa**, with greenish discharges. This influence is thoroughly accomplished in the use of the Arsenite of copper, to which the reader is referred.

Arsenic has won considerable reputation as an antiperiodic. In that class of cases in which there is marked impairment of the sympathetic nervous system, it imparts **tone** to the **nervous centers**. It is especially adapted if the paroxysms are of irregular occurrence, or erratic in character. Small doses will accomplish good results in such cases, even better than large ones. The functions of the stomach, liver and other glandular organs are improved at the same time.

In the treatment of diseases of the skin Arsenic is in common use. It is adapted to all **scaly eruptions** and to chronic **eczema**. It is useful in **psoriasis**, in **pemphigus** and **lichen**. In that form of eczema which affects the soft tissues, such as those of the anus, scrotum and vulva, it is especially applicable.

It should be borne in mind in the treatment of skin diseases that better results are usually obtained from small doses than from large doses, and that if satisfactory results do not occur, better results may be obtained if the dose is decreased.

Although Arsenic has been long used in **chorea**, it is not so advised by Eclectic clinicians, other methods available to them being much more successful.

Liquor Potassii Arsenitis.

Synonym—Solution of the potassium Arsenite, Fowler's solution.

Administration—This solution, probably the most common of the Arsenic solutions and the most convenient for adminis-

tration, contains one per cent of Arsenous acid. Although ten minims is given as the maximum dose, we would advise, however, that a dose above five minims be always given with great caution. Our range of administration is from one-fourth of a minim to five minims.

CHAPTER V.

Agents Used as Evacuants of the Stomach—Emetics.

EUPHORBIA.

MUSTARD.

COPPER SULPHATE.

ZINC SULPHATE.

ZINC ACETATE.

EUPHORBIA.

EUPHORBIA COROLLATA.

Synonym—Large flowering Spurge.

Part Employed—The bark of the root.

Natural Order—Euphorbiaceæ.

Locality—United States.

Botanical Description—*Euphorbia Corollata* is a perennial plant growing in the southern section of the Union; stem erect, round, slender, two to three feet high; leaves sessile, lanceolate obtuse, entire; flower umbels, five-rayed; involucre large, white, showy like the corolla; capsule smooth, three-lobed, each containing a single ash-colored seed; root yellowish, large, branching, one and a half to two feet long, one inch thick, cylindrical, brown or blackish; bark thick, forming a major part of the root; odorless and nearly tasteless, but pungent, acrid when chewed some time. Solvents, alcohol, water. Dose, two to ten grains.

CONSTITUENTS—Euphorbin, glucoside, resin.

PREPARATIONS—Specific *Euphorbia*. Dose, from one to ten minims.

Physiological Action—Emetic, diaphoretic, expectorant, epispastic. In large doses it causes emeto-catharsis, and in some cases inflammation of the stomach and bowels.

Therapy—Though *Euphorbia* acts as an emetic it is but little used for that purpose, being too harsh in its action, inducing hydragogue catharsis at the same time. While in extreme doses it may cause acute gastro-enteritis, in small doses it stimulates normal functional activity of the stomach, influencing the glandular function of the entire gastro-intestinal tract. In the **atonic dyspepsia** of enfeebled conditions of the stomach, with bad breath, bad taste in the mouth, furred tongue, anorexia and constipation with a sense of weight in the stomach, and occasional colicky pains in the bowels, it is a good remedy. Ten drops of the tincture in two ounces of water, a teaspoonful every two hours, will relieve this common train of symptoms. It has

been used in cholera infantum and other summer diarrhœas of children with good results. It is advised in the tenesmus of dysentery, and in the diarrhœa of exhausting diseases.

SINAPIS.

SINAPIS ALBA.

SINAPIS NIGRA.

Synonyms—Mustard, white, black or yellow Mustard.

Part Employed—The seed of *Brassica Alba* or *Nigra*.

Natural Order—Cruciferae.

Locality—Wild in United States, cultivated in Southern Europe and Asia.

Botanical Description—The Mustard plants, both black and white, are annuals; the white about two feet and the black about three feet in height. The black Mustard is erect; branches numerous, upper leaves entire, smooth above, dependent, pinnatifid, serrated unequally; flowers small, wide, yellow; calyx colored, set closely on the peduncles; fruit three-quarters of an inch long; pods erect, smooth, quadrangular, beaked, containing from three to seven minute dark seeds one-twenty-fifth of an inch in diameter, globular, hard; taste pungent, acrid, nauseating. Powdered Mustard is deep yellow in color, pungent in odor, and of not unpleasant taste.

PREPARATIONS—Powdered Mustard. Oil of Mustard. Dose, from one-twentieth to one-tenth of a minim.

CONSTITUENTS—Volatile oil.

Physiological Action—Mustard is emetic, stimulant and actively revulsive with marked anodyne properties. Its application to the skin produces intense burning, violent inflammation, and if persisted in too long, sloughing or ulceration. Taken into the stomach in large quantities, if emesis be not produced, it causes a burning sensation and a mild form of gastritis.

Specific Symptomatology—For external application it is indicated in **acute** cutting **pain** local in character, usually intermittent and usually present as the result of rapidly developing acute inflammation; but dull, steady and constant pains or soreness, slowly developing and persistent, are not readily relieved by its application. Turpentine externally is of service in these cases.

Internally it is indicated to excite vomiting when non-corrosive poisons have been taken, when a foreign body is lodged in the esophagus, or when there is great distress from an overloaded stomach.

Administration—In the use of Mustard for counter-irritation, in cases of acute pain, it is desirable to obtain its sharp effects as quickly as possible. In order to do this, a fresh article should be procured, one in which the pungency is sharply indicated by its action on the nostrils and eyes, since mustard kept

in a paper package on the shelves for weeks is inert from loss of the volatile oil. A heaping teaspoonful of the fresh powder is thoroughly rubbed up with water, not hot however, as hot water dissipates the oil too quickly, leaving the powder inert. All lumps are rubbed out, and a smooth paste is formed which should be spread on a thin cloth of the size desired, and covered with another piece of cloth. The poultice so prepared should be laid on a large warm plate and carried to the bedside and applied warm, as a cold poultice causes a shock to the patient. A warm folded flannel compress may then be laid over the poultice. In from six to ten minutes, depending upon the strength of the mustard, a sensation of burning occurs which soon becomes hard to bear, and there is produced at the same time a deep redness which will be quickly followed by vesication which must be avoided, as the blisters thus caused are of no advantage, and exceedingly painful and difficult to heal. The poultice is removed when the surface becomes uniformly reddened, and the skin should be gently sponged with warm water and dried. It is desirable to cover it with a smooth layer of soft cotton, or gauze, which soon quiets all pain. The white of an egg rubbed up with mustard and a little water, will produce a poultice which will not readily blister.

When mild counter-irritation only is desired, which is to be prolonged for some hours, a poultice is made in the proportion of one part of mustard to four or six of linseed meal or flour. This is not, however, effective in acute pain, but only where there is soreness or prolonged distress. Vinegar and mustard also make a good poultice for prolonged use, as vinegar destroys an excess of activity of the mustard.

For a hot mustard pediluvium, a tablespoonful of the powder is stirred into a gallon or two of hot water, in which the feet are immediately immersed.

For a general mustard bath, two or three tablespoonfuls of mustard are mixed in a full bath. For a child one tablespoonful will be sufficient, care being taken to protect the eyes of the patient from the vapor.

Therapy—A teaspoonful of mustard in a bowl of warm water will produce active and immediate **emesis**. This should be followed by another bowl of warm water alone, which will continue the evacuation and wash out any remaining mustard, as even then the burning sensation from the local effects of this substance with a few patients is hard to bear. Emesis must be obtained as soon as possible after the ingestion of the mustard. An emetic dose must not be allowed to remain in the stomach, as inflammation may follow.

Mustard has but little therapeutic influence when administered internally. It does not seem to increase the tone of the gastro-intestinal canal, or promote the action of the secretory

or excretory glands, or assimilative organs, to any great extent, but its external use is common.

In the treatment of **acute pleuritis** a warm poultice applied over the affected side sufficiently large to much more than cover the diseased area, will usually relieve the pain at once, and a large poultice is always more effective than a small one. It may be necessary to repeat its application within twenty-four hours, but if vigorous, direct treatment is adopted this is seldom necessary.

In **bronchitis** or **pneumonitis** in the initiatory stages, a quick poultice of mustard will exercise a good influence, but it does not give the immediate relief experienced in **pleuritis** or **pneumonitis** where acute pain is a prominent symptom. It should be followed, in the former conditions, as soon as the sensitiveness of the skin will allow, by persistent heat, moist or dry, as seems indicated.

In acute **pain** in the **heart**, either in angina pectoris or from other cause, a sharp mustard poultice is essential.

In acute **stomach** pains and in intestinal colic, or pain in the abdomen from any cause, a large hot mustard poultice will be of much service. In all cases where mustard is used it is only auxiliary to other prompt treatment, as its influence is usually transient.

A most efficient measure in **congestive headache**, or in headache from any cause with fullness of the cerebral vessels, is a mustard poultice on the nape of the neck.

Spinal irritation is most effectively treated by the use of a succession of these poultices. On the first day of the treatment one is applied on the back, across the upper third of the spine; on the second day across the middle third, and on the third day across the lower third, producing thorough sharp counter-irritation but no blistering. On the fourth day it is applied at the top of the spine again and the same course followed as before. This may be continued for two weeks or more if the skin is sufficiently restored in the interim between the poultices. This course will most materially assist other measures adopted in the treatment of this condition.

A hot mustard foot bath is of great service in **congestive chill**, also in the chill at the onset of acute fever, or acute inflammation of any character. It produces immediate derivation, assists in equalizing the circulation, acts as a diaphoretic and perceptibly checks the progress of the disease.

In the **recession** of the rash of **eruptive fevers** no measure is more prompt than a general hot mustard bath, which should be continued until a mild redness covers the entire body.

At the onset of acute **cerebro-spinal meningitis** the disease has been completely aborted by the prompt use of a hot mustard bath. In some cases the patient may be wrapped in a

blanket wrung out of hot mustard water, until the skin is red-dened.

In conditions where there is a constant tendency for the skin of the legs to become cold, and the muscles to cramp during the night, a hot mustard foot bath at bedtime is of direct benefit.

In **arrest** of the **menses** from cold, a sitz bath strong with mustard will sometimes produce an immediate restoration of the flow. It is always of assistance to other measures. It is sometimes necessary to take this bath each night for a week preceding the time the menses should appear and continue it until that result is obtained.

COPPER SULPHATE.

Formula— CuSO_4 .

Synonyms—Blue Vitriol, Bluestone.

Occurrence—The Sulphate of Copper is produced by heating copper in sulphuric acid and dissolving the product in hot water, when it is evaporated to dryness.

Description—It forms in large deep-blue crystals without odor, but with an exceedingly unpleasant metallic taste. It effloresces in the air; is soluble in two and one-half parts of cold water and five-tenths parts of boiling water, and almost entirely insoluble in alcohol.

Therapy—Given in doses of five grains dissolved in water the Sulphate of Copper is a **prompt emetic**, acting quickly and without irritation. It is in common use in the same conditions for which the sulphate of zinc is advised, especially as an emetic for the evacuation of the stomach after poisons are taken.

Its influence in small doses upon the stomach increases the flow of gastric juice, as it does of saliva in the mouth and also of the intestinal juices. Its use is limited by the irritation produced even by small doses. It has been advised in **gastric ulcer**, in atonic conditions of the stomach and bowels with loose, watery **diarrhœas**.

This agent is one of the chemical antidotes for phosphorus in poisoning by that agent. It is administered carefully, as the agent itself is poisonous.

Externally it acts upon **raw surfaces** and **open sores** and **wounds** as a caustic and antiseptic, and is somewhat painful and irritating in its action. It serves a good purpose in solutions of one grain to the ounce of distilled water in purulent inflammations of the eyes, and in all catarrhal and ulcerative conditions of mucous membranes wherever located.

ZINC SULPHATE.

Formula— ZnSO_4 .

Occurrence—The Sulphate of Zinc is the direct result of the decomposing action of metallic zinc in granular form upon sulphuric acid. The salt is crystallized after certain processes of purification.

Description—It occurs in the form of transparent rhombic crystals, somewhat resembling those of magnesium sulphate, colorless and odorless, but possessing a metallic taste with marked astringency. It is readily efflorescent in dry air, assuming the form of a dry white powder. When heated it rapidly liquefies by being dissolved in its water of crystallization, which is rapidly driven off with decomposition of the salt, leaving the zinc oxide. It is readily soluble in water and in three parts of glycerine. It has an acid reaction in these solutions. It is insoluble in alcohol. Dose, from one-fourth to one-half grain. As an emetic, ten grains in water shortly repeated.

Physiological Action—This agent is an active **irritating emetic**. It is used when profound and immediate emesis is necessary, as after the ingestion of poisons. When given in overdoses, the vomiting is extreme and there is persistent retching. This influence produces profound exhaustion, great anxiety, restlessness, and apprehension for personal safety. Death is not common from its use, as the vomiting expels it from the stomach usually before the exhaustion is complete. Death has occurred after the taking of one and one-half ounces.

A hypodermic injection of morphia, and stimulants and the use of bland drinks and counter-irritation over the stomach, will ultimately control the results of its action. If there are evidences of an approaching inflammation these must be promptly met by appropriate measures.

If the stomach is in a state of irritation when evacuation seems imperative, the stomach pump or irrigation should be used and this agent should be avoided.

Therapy—With a very torpid stomach, heavy coating on the tongue, and pale, flabby mucous membranes, this agent will produce a good result, by arousing the action, unloading morbid secretion and stimulating the nervous influence of the stomach, but vegetable emetics devoid of irritating properties will accomplish the same result in a much more satisfactory manner.

It was in use at one time in the treatment of **gastric catarrh**. It was given in small doses, probably not exceeding one-fourth of a grain. It should be beneficial in this disease from its inherent properties, but we have not used it in this condition because we have not needed it.

It was popular at one time as an **antispasmodic** and was ad-

vised in **epilepsy** and in **chorea**. It will certainly control the irregular movements of the latter condition in some cases, but probably does so through the profound relaxation induced by its influence upon the stomach. Whether so, or through the nervous centers direct, all of its results can now be produced without irritation or other untoward influences by the use of other well known agents. It has been given as an emetic in **membranous croup**, and in **spasmodic croup** and **whooping-cough** and in other laryngeal disorders.

The agent has antiseptic properties, is very astringent, and is said to be tonic to the surfaces to which it is applied. It is widely used as a topical application or as an injection or wash. In **catarrhal conditions**, especially of ulcerated surfaces, this agent is excellent when applied in mild solution. In post-nasal catarrh a hot douche which contains one grain of the salt to an ounce of water, to which a few drops of the colorless hydrastis have been added, is indeed most soothing and efficacious. The same combination is very useful in **gonorrhœa** and should be carefully used once or twice daily, usually after a warm solution of the hydrogen peroxide has been introduced. This is not as strong as is commonly advised, but it is sufficiently so for such purposes.

In **leucorrhœa** this combination of a strength of about four times the above is most serviceable. In **gonorrhœal** inflammation within the vagina its strength for a few applications must be even greater, but it may be reduced in strength as the severity of the disease abates. In all catarrhal cases it is well to first thoroughly cleanse the mucous surfaces by a douche of hot sterilized water, or a mild antiseptic douche.

One grain of the hydrastine hydrochlorate and five grains of the Zinc Sulphate may be dissolved in an ounce of aqua rosæ, and of this solution from five to ten drops may be added to a teaspoonful of warm water and this may be slowly instilled into the eye twice daily, in all forms of acute inflammation, especially if of a purulent character, with the most satisfactory results. It is difficult to make a better collyrium for **purulent conjunctivitis**. In extreme cases, mild counter-irritation on the temples will be found necessary in addition.

The above combination is even superior in all ulcerated and catarrhal conditions to the one previously advised, but the hydrastine salt is too expensive for the free use necessary in vaginal douching.

It is used as an application to **indolent ulcers** and to unhealthy granulating surfaces, and as a wash in threatened **gangrene**. It stimulates healthy granulation and restrains the formation of pus.

The **dried Zinc Sulphate** made into an ointment is a safe and manageable caustic in ulceration of the cervix uteri, in urethral

caruncles, warts and fungoid growths, in lupus and in condylomata. In these cases at least one-fourth of the ointment should be of the Sulphate. It should be used with care. In ulcers a much milder ointment may be used.

ZINC ACETATE.

Formula— $\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2 + 2\text{H}_2\text{O}$.

Occurrence—The Acetate of Zinc is obtained by a reaction which occurs between acetic acid and the carbonate of zinc in boiling water. The salt crystallizes out of the reduced liquid.

Description—It assumes the form of monoclinic plates of a soft white pearly luster. It has an astringent metallic taste a faint odor of acetic acid, and a slight acid reaction. It is efflorescent in the air, and soluble in less than three parts of water and in thirty-six parts of alcohol. When the salt is boiled continuously, its character is altered by the loss of the acid radical, and its solubility is lessened.

Administration—It may be given in doses of from one-half to one-twelfth grain. In large doses of from fifteen to twenty grains it is emetic and irritant. It is given in free solution, in water.

Therapy—The properties of this agent are those of an irritating tonic and astringent. It is but little used internally, although it is advised in debilitated conditions with great relaxation, where there is profuse watery excretion. It will control **passive hemorrhages**.

The salt is used externally for much the same purpose as the acetate of lead. In weak solution it is used as a collyrium in conjunctivitis and in granulation of the lids. One grain to the ounce of water is sufficient strength. It is also used as an injection in gonorrhœa by those who are not familiar with the sure action of tonic vegetable astringents and mild antiseptic irrigations.

Note—In addition to the Emetics given in this chapter we have also lobelia, ipecac and apomorphia, classed elsewhere because of more important influences which they possess. These three above-named remedies are often superior for the same purposes, to any named in this chapter. The zinc and copper sulphates, however, are in common use as emetics in emergency cases.

CHAPTER VI.

Acids Used for their Direct Influence Upon the Gastro-Intestinal Canal.

HYDROCHLORIC ACID.

NITRO-HYDROCHLORIC ACID.

NITRIC ACID.

SULPHURIC ACID.

AROMATIC SULPHURIC ACID.

TARTARIC ACID.

Physiological Action of Mineral Acids—These agents are all destructive to organic bodies. They abstract water from the tissues rapidly, coagulate the albumen and destroy protoplasm. The weaker solutions are irritant, vesicant and astringent. Increased in strength they produce local inflammation and in full strength they produce rapid disintegration of tissue structure.

The physiological action is obtained by the administration of medicinal doses of the dilute acids always further diluted with an abundance of water. As one of the evidences of their absence in the system is a deficiency of secretion, so their administration **increases** the **secretions** of all the gastro-intestinal glands and glandular organs. The mouth becomes moist from an increased flow of saliva, the digestive fluids increase in quantity and the appetite is improved. Their continued use may overstimulate the salivary glands, but there is a reaction on the part of the gastro-intestinal glands resulting in greatly lessened secretion. They have astringent properties and will ultimately constipate the bowels.

Their absorption into the blood neutralizes the normal alkalinity of that fluid, causes contraction of the capillaries and increases the arterial tension by increasing the force of the heart's action. They do not to any great extent exercise a direct influence upon the nervous system. The most active of these acids in this particular is the sulphuric acid. This is prescribed in the form of the aromatic sulphuric acid and has a slightly tonic and sedative effect upon the nervous centers.

Their influence in neutralizing the alkalinity of the blood increases the acid character of the secretions, notably that of the urine.

Toxicity—Poisoning from these acids occurs from the local destruction of tissue which takes place so rapidly that but little absorption of the acids occur. Their poisonous influence should be treated by the administration of alkalies to effect in a chemical manner, their neutralization. It is often a fatal waste of time to undertake to protect the tissues from their influence by the administration of oils and other unctuous substances. The introduction of a stomach tube is dangerous because of the ease with which the walls of the stomach or esophagus are perforated.

Antidotes—In the selection of alkalies to neutralize these acids when taken in excessive quantities, the carbonates and bicarbonates should be avoided if possible where the liberation of carbonic acid gas is likely to produce distention or rupture. The free sodium or potassium hydrate in common soap is an active neutralizing agent, and a dilute solution of the soap may be administered. Liquor potassium, calcined magnesia, lime water or aqua ammonia, fully diluted, may be administered. The administration of the carbonates of magnesia, sodium or potassium is of advantage and very efficacious where the liberation of gas will not produce harm. Treatment subsequent to the neutralization of the acid consists of the administration of demulcents with hypodermics of strychnine and brandy, and of morphine if necessary to relieve severe pain.

Physiological Action in Medicinal Doses—Ringer claims that acids allay thirst by promoting the secretion of alkaline saliva; that acids before meals check the secretion of the normal acids of the gastric juice, and that if given after meals where there is a persistently sour stomach, the acidity will be increased; that acids stimulate the salivary secretion first by an impression upon the mucous membrane, which is conducted to the spinal cord and thence reflected through the cerebral and spinal nerves to the salivary glands, because if these nerves are divided, acids have no influence on the salivary secretion.

The influence of acids then, in increasing the action of the salivary glands, greatly lessens the thirst of fever patients and overcomes the extreme dryness of the mouth and mucous membranes. The thirst lessened, general irritability of the nervous system is soothed. Sleep follows as perspiration appears upon the skin, the temperature is reduced and a general beneficial result follows.

Specific Symptomatology—In the administration of acids the presence or absence of these in the system must be fully considered.

The general predominance of an alkaline condition is evidenced by a red condition of the mucous membranes of the mouth. A thin, narrow-pointed, red tongue, with usually a deficiency of the secretions, or a dry, brown coating on the tongue, or a sleek, red, dry tongue, shows a demand in the system for acids, and their administration is usually prompt in overcoming a train of symptoms dependent on this condition, and greatly facilitates the action of other indicated remedies. There may be, however, in some cases, occasionally in protracted fevers, a fullness of acids in the system at large, with deficiency of secretion of hydrochloric acid. This is evidenced by extreme anorexia. The tongue is usually moist and the papillæ are red at the base, but elongated and tipped with a white coating, through which the pinkish redness of the base can be seen. In

these cases if alkaline salts given prior to eating do not stimulate a secretion of hydrochloric acid, that agent must be given regularly for some time, especially after the taking of food.

We have known this condition to persist during neurasthenia where the redness of the tongue or membranes was not marked, but where the white-tipped papillæ persisted for months. The food test showed an almost complete absence of hydrochloric acid—achlorhydria—while the urine and other secretions were acid in reaction.

ACIDUM HYDROCHLORICUM.

Synonym—Hydrochloric Acid.

Description—Free hydrochloric acid is a colorless gas with a pungent odor and with a sharp, acid, caustic taste. It is irrespirable and destructive to vegetation. Thirty-one and nine-tenths per cent of this gas dissolved in water constitute the **official hydrochloric acid**. The **dilute hydrochloric acid** of the pharmacopœia contains only ten per cent of the gas.

Occurrence—The gas is made by the action of sulphuric acid upon the chloride of sodium. It is a by-product also in the manufacture of sodium sulphate from common salt. It may be also made from the chloride of magnesium or potassium.

Description—**Hydrochloric Acid** is a colorless liquid which fumes strongly in the air, is intensely corrosive and actively destructive to all organic bodies.

It has a specific gravity of 1.163. The odor of this gas is pungent, and irritating to the respiration.

Acidum Hydrochloricum Dilutum.

Synonym—Hydrochloric Acid Dilute.

The strong acid is too concentrated for medicinal purposes, consequently the dilute acid is alone universally employed in therapeutics. It is made by combining three ounces of the full strength acid with seven ounces of distilled water. It is preserved in glass stoppered bottles.

Administration—The dose of the dilute acid is from five to thirty minims well diluted. It should be taken, as all the mineral acids should, through a glass tube to prevent its destructive action upon the enamel of the teeth.

If colic, disordered bowels and vomiting occur from the administration of acids, it is an evidence that they are contra-indicated.

Therapy—Hydrochloric Acid, the free acid of the gastric juice, is essential to digestion. When deficient in the digestive fluids, the evidences of which have been named, it may be

directly supplied. **Indigestion** due to this cause is treated by the administration of from five to twenty drops of the acid in water immediately after eating. Its administration in these cases every two or three hours is sometimes necessary to complete the digestion and restore tone to the stomach, stimulating the glands to normal secretion.

When its indications are present it is a most efficient remedy in **low fevers** and in **typhoid** forms of inflammatory fever, and is of much value in malignant scarlet fever. It is indicated in many cases of **phthisis pulmonalis**, and in nearly all cases of **neurasthenia** at some time during the course of the treatment.

It is an excellent remedy also to counteract phosphaturia and the deposit of phosphatic sediment or calculi in the urine.

As in the **chronic catarrh** of the stomach in alcoholics and in **cancer** of the stomach, there is usually absence of hydrochloric acid, in these cases this acid is demanded.

ACIDUM NITRO-HYDROCHLORICUM.

Synonym—Nitro-hydrochloric Acid.

Occurrence—Nitro-hydrochloric Acid is made by combining six fluid ounces and forty-one minims of full-strength nitric acid with twenty-seven ounces, five drams and forty-eight minims of Hydrochloric Acid in a glass vessel. This forms what was known as the aqua regia of the alchemists and earlier chemists because of its power to dissolve gold.

Description—This combination forms an intensely corrosive fuming liquid. It has a golden-yellow color and may be wholly volatilized by heat. It is unstable and should be kept in small bottles which are only in part filled and are kept in a dark, cool place.

Administration—For medicinal use it is prepared by adding water at the time the acids are united, in the proportion of three ounces of Nitric and four ounces of Hydrochloric acid and twenty-five ounces of water. It is advisable, however, to unite the acids before the water is added. From five to twenty minims of this, well diluted, is prescribed for internal use.

Therapy—It is somewhat difficult to determine the exact cases in which this acid is superior to its constituents given singly. It is, however, specific in cases of functional **torpor** of the **liver** and in **incipient cirrhosis**. It stimulates the flow of the bile in a marked manner. In **chronic hepatitis** it is sometimes very valuable. It is contra-indicated where there is obstruction to the flow of the bile, or catarrh of the gall duct. In these cases its use should be preceded by such remedies as chionanthus, iris versicolor or leptandrin. Like its constituents it is beneficial in many forms of **dyspepsia** from deficient secre-

tion, both of the glands of the stomach and those of the intestinal canal. It is also valuable in the oxalic and uric acid diathesis.

ACIDUM NITRICUM.

Synonym—Nitric Acid.

Description—Nitric Acid, or aqua fortis in its pure state, is a heavy, colorless, fuming liquid, with a specific gravity of 1.52. It boils at 187 deg. Fahr. and freezes at 40 deg. It is intensely corrosive and is not stable, changing its character by heat or when exposed to the air. It acts violently upon all organic substances, and upon metals, either alone or in their compounds. Its union with non-nitrogenous organic substances, such as sugar, glycerine and cotton, forms explosive compounds.

Nitric Acid was known in the eighth century. Raymond Lully, in the eleventh century, described its composition fully.

PREPARATIONS—There are at least five varieties of Nitric Acid in commerce and pharmacy:

First—The pure acid, just described, marked C. P. (chemically pure). It must be kept in strong glass bottles in the dark, the bottles always full, and stopped with glass stoppers, sealed with paraffine.

Second—The commercial aqua fortis, a yellowish, very impure liquid, too impure for chemistry or pharmacy, sometimes containing arsenic, iron, sulphuric or hydrochloric acid, and the nitrogen oxides. It is also in two strengths—the *single acid* containing 39 per cent of the strong acid, and the *double acid* containing 64 per cent.

Third—The *Fuming Nitric Acid*, highly concentrated, *more or less free* from impurities. It is of a reddish-yellow color, and is a powerful oxidant.

Fourth—The U. S. P. *Acid*. It contains 70 per cent of the C. P. concentrated acid; is a valuable caustic and escharotic.

Fifth—The *Dilute U. S. P. Acid*. It contains only 10 per cent of the C. P. acid. The B. P. acid contains 17.44 per cent.

Occurrence—Nitric Acid may be prepared by the action of sulphuric acid upon the nitrate of sodium or potassium in a glass retort, $\text{Na}(\text{NO}_3) + \text{H}_2(\text{SO}_4) = \text{HNa}(\text{SO}_4) + \text{H}(\text{NO}_3)$. The Nitric Acid is driven off by distillation.

Administration—For internal use the diluted acid only is administered. It must be given freely diluted and taken through a glass tube or a straw. The dose is from one to six or eight drops three times daily. Three drops every three hours is about the usual prescription. As a caustic the full strength C. P. acid may be used, avoiding the destruction of too much tissue at a single application.

Nitric Acid produces on animal tissues a characteristic yellowish discoloration, by which its action may be known.

Specific Symptomatology—When the indications for the action of this acid are conspicuous, the tongue and mucous membranes are of a violet, carmine or clear red color, the membrane being apparently transparent, showing the red color through or below it. There is marked deficiency of secretion from the mucous membrane and glandular structures.

Therapy—This agent in medicinal doses is an excellent tonic, antiseptic and astringent. It stimulates the intestinal glands, modifying their function and inducing normal activity. Although not naturally present in the intestinal juices, it operates very similarly to hydrochloric acid. If there is diarrhoea with indigestion, this agent is superior. If there is constipation, hydrochloric acid is preferable.

When indicated, it operates satisfactorily in cases of **indigestion** if given after the meal. In some cases of **chronic gastric acidity** a few drops of dilute nitric acid given four or five times a day will produce a permanent cure. In some forms of intestinal indigestion evidenced by pain in the bowels, occurring from one to two hours after eating, this agent is curative.

It may be given in alternation with other digestives or bitter tonics. In **chronic diarrhoea of children**, with persistent green discoloration of the fecal matter, especially if alkaline in reaction and of an offensive odor, the agent is of much service.

In **intestinal hemorrhage** and **bleeding piles**, nitric acid has been given with good results. A lotion of the acid may be applied in the latter case. Nitric acid given when **uric acid** is excreted in abnormal quantities, or where the **oxalic acid diathesis** is present, will relieve both of these conditions.

Externally both nitric acid and hydrochloric acids were at one time used very extensively in baths. They exert a very powerful stimulating influence upon the function of the skin. This is most marked in the night sweats and debilitating perspiration following exhausting fevers and accompanying pulmonary tuberculosis.

Nitric acid in full strength applied to **chancres** and **chancreoids** destroys at once the specific character of these ulcers. If carefully applied, no harm to surrounding tissue nor local inflammation is induced, and it is but seldom that a second application will be needed. It is applicable to **phagedenic ulcers** and to **gangrene**.

ACIDUM SULPHURICUM.

Synonyms—Hydrogen Sulphate, Sulphuric Acid, Oil of Vitriol.

Occurrence—From a commercial standpoint this is the most important of all the acids known.

Sulphuric Acid was known in the 15th century. It occurs in the natural springs and in some rivers. In the process of its manufacture sulphur is burned in the air, and the product, SO_2 , is conducted into a lead chamber, which contains the higher nitrogen oxides and water vapor.

The nitrogen oxide acts as an oxygen carrier to supply the oxygen necessary to form the sulphuric oxide, which unites directly with the water vapor to form the acid.

Description—It is a dense, colorless, oily, corrosive acid liquid, with a specific gravity of 1.85. It has a strong attraction for water and is used as a drying agent. It unites with water with extreme vigor, producing great heat.

PREPARATIONS—There are four varieties of Sulphuric Acid:

1st. The *commercial oil of vitriol*, too impure for chemical or medicinal purposes—used only in manufactures. It has a brownish-yellow color.

2nd. The *colorless pure acid*, just described, marked C. P.—chemically pure.

3rd. The *glacial acid*, which crystallizes at ordinary temperatures.

4th. The *dilute acid* of the pharmacopœia, which contains only 9 or 10 per cent of the strong acid. This dilute acid—the *medicinal Sulphuric Acid*—is prepared by combining three and one-half ounces, by weight, of the acid with thirty-two and one-half ounces of distilled water. The acid is added slowly to the water and not the water to the acid. Extreme heat is evolved by the process of mixing.

Acidum Sulphuricum Aromaticum.

Synonyms—Aromatic Sulphuric Acid, Elixir of Vitriol.

Occurrence—This acid is made by combining three and three-fourths fluid ounces of sulphuric acid, one and five-eighths fluid ounces of tincture of ginger, and alcohol a sufficient quantity to make thirty-three and three-fourths fluid ounces. It is preserved in glass-stoppered bottles.

This acid contains about twenty per cent of the official sulphuric acid. A chemical change takes place, forming in part the ethyl-sulphuric acid, and probably the sulphovinic acid. Aromatic Sulphuric Acid is a light straw-colored liquid of a pleasant aromatic odor and an agreeable acid taste. It differs materially from the dilute sulphuric acid.

Administration—The dilute sulphuric acid and the aromatic acid only are administered internally. The dose of either is from two to twenty drops well diluted. As an escharotic the C. P. acid is used.

Physiological Action—The physiological action of sulphuric acid in a general way is described heretofore in the general action of mineral acids. It neutralizes alkalinity, produces irritation of the mucous membranes and in extreme cases may produce gastro-intestinal irritation. If this irritation is at all severe, a congestion of the intestinal glands may result which materially interferes with the process of nutrition, the patient dying from inanition. Muscular weakness is one of the results of overdoses of this acid.

Specific Symptomatology—In fevers, a brown-coated tongue of dark color, with dark mucous membranes; the coat increasing in color in the center to black; the tongue usually dry, with deep red tip and edges, indicates sulphuric acid.

Therapy—The strong acid has been used as a caustic, but is more irritating than nitric acid, which now replaces it in all conditions in which it was previously used, with perhaps the single exception of the cauterization of the bites of rabid animals, in which it seems to be superior to other caustics.

As an antiseptic and stimulant to mucous surfaces it acts similarly to the sulphurous acid. It is superior, however, in **adynamic diarrhœas** or diarrhœas with extreme prostration. It is not only an antiseptic in these cases, but exercises a positive astringent effect. Used in epidemics of **cholera** its apparent influence has been very marked. Many patients taking it in anticipation of the attack have failed to be attacked. A pleasant method of administration in these cases is from four to six drops of the Aromatic Acid in a glass of sweetened water, forming an artificial lemonade, which may be drank at the pleasure of the patient.

The lemonade above mentioned is a very grateful drink in **typhoid** or **typhus** fever when this condition prevails. In all inflammatory conditions with these indications, especially in inflammation of the vital organs, and in **erysipelas** the influence of this acid will often apparently cause a decline of the fever.

This agent is a reliable **hemostatic** in passive hemorrhages; where there is feebleness of the mucous membranes with sluggish capillary circulation it is excellent. The Aromatic Acid is much the more active in this particular. This inherent property renders this agent useful in excessive mucous discharges from whatever locality, being eliminated rapidly from the skin; the astringent and stimulating influence of the agent is exercised directly in the control of colliquative **night sweats**. The tonic properties of the agent making it especially desirable for this

purpose in the protracting sweats that follow all forms of continued fever and the night sweats of pulmonary consumption.

The agent was at one time used for prolapsus ani, piles, fissure of the anus or rectum, also phagedenic ulcers, aphthous ulceration of the mouth and salivation, for which we have mentioned the use of the sulphurous acid.

King ascribes nerve tonic properties to this remedy and advises it in certain forms of **nervous prostration**, especially where there is irritation of the spinal cord. In cases where quinine may be used in conjunction, that agent may be dissolved in this acid and given in an aromatic syrup or elixir.

ACIDUM TARTARICUM.

Synonym—Tartaric Acid.

Occurrence—Tartaric acid is prepared usually from the acid tartrate of potassium in the presence of prepared chalk, chloride of calcium and sulphuric acid.

This acid is present in many fruits, especially in the grape, from which it is deposited during the process of fermentation, when present in excess of its solubility in alcohol.

Description—It crystallizes in the form of translucent monoclinic prisms without color, or as an odorless white powder with a strong acid taste. It is freely soluble in water and in boiling alcohol and in two and one-half parts of cold alcohol. It is insoluble in chloroform, but soluble in two hundred and fifty parts of ether.

Physiological Action—This acid acts in much the same general manner as citric acid. It is rather irritating in its influence even in medicinal doses, and in overdoses it is an irritant narcotic poison.

This acid is used to adulterate citric acid and is a constituent of cheap lemonades. It is injurious because irritating. Its constant use produces dyspepsia, apepsia and general gastric irritation.

It has produced death from irritation and subsequent inflammation of the stomach or bowels.

Therapy—It stimulates the mucous and salivary secretions and is a somewhat efficient agent in **fevers**. An artificial lemonade can be made from this acid by dissolving it in water and adding a few drops of the essence of lemon. By adding a small quantity of this acid to the bicarbonate of sodium or potassium, a pleasant effervescent drink is made.

CHAPTER VII.

Agents Used as Assistants to Gastric or Intestinal Digestion—Digestives.

PEPSIN.

PAPAW.

PINEAPPLE.

PANCREATIN.

INGLUVIN.

TAKA-DIASTASE.

PEPSIN.

Occurrence—Pepsin is the natural enzyme—a proteolytic ferment, obtained from the glandular structure of the lining membranes of the fresh stomach of the domestic hog—*sus scrofa*. It is an essential constituent of the gastric juice.

The mucous membrane of the stomach is finely chopped and macerated for several days in water, to which a small quantity of hydrochloric acid has been added. The supernatant liquid is then carefully poured off and strained and treated with sodium chloride, when the Pepsin is precipitated and floats upon the surface. It is skimmed off and carefully dried.

This ferment may be obtained by other processes, but this method is simple and the one most usually adopted.

Description—Pepsin occurs in the form of scales, granules or as an amorphous powder. It is yellowish-white, translucent, has a characteristic odor and a peculiar, moist, elastic feel to the touch. To the taste it is slightly acid, bitter, saline. It is soluble in 100 parts of water, but by the addition of hydrochloric acid its solubility is greatly increased. It is insoluble in alcohol and chloroform.

It should have a digesting power equal to 3,000 times its own weight of freshly coagulated egg albumen.

Administration—It is given in the form of the powdered Pepsin or as saccharated Pepsin in doses of from three to ten grains. The essence of Pepsin in dram doses is an excellent form for administration.

Physiological Action—Pepsin digests the nitrogenous constituents of food, converting them into peptones. Its action is increased by the addition of hydrochloric, lactic and citric acids.

Therapy—A deficiency of the digestive ferments in the stomach, evidenced by **painful** or **imperfect digestion**, is largely supplied by the administration of Pepsin. Whenever severe disease induces inactivity of the glandular organs of the body, there is apt to be inefficient action of the peptic glands, and consequently a deficiency of Pepsin. This is the case after **severe shock**, either from injury or from surgical operation, in **neurasthenia**, and in **brain** or **spinal disease**; also in severe **acute inflammatory disease**, in **protracted fevers**, in **heart disease**, in **diabetes**, and especially in **gastric ulcers** and **cancer**. In all these cases, there being atonicity with enfeeblement of functional operation, Pepsin in conjunction with tonics, stomachics and hydrochloric acid is often demanded.

Infants fed on artificial food are benefited by the use of Pepsin. It may be given during or at the end of the meal, and is often productive of excellent results.

Where **malnutrition** is marked, and the growth and development of the child retarded from this cause, this agent is sometimes the means of accomplishing a complete cure. In **diarrhœa** in childhood from indigestion, a most important factor in the treatment, is the perfect digestion of the food. A little skill on the part of the physician can often so adjust the administration of Pepsin as to satisfactorily accomplish all desired results in such cases, often without the use of astringents. Mild intestinal antiseptics are often necessary in conjunction.

It is argued that artificial digestion, by doing the work of the gastric juice, is apt to produce impairment of the function of the gastric glands because of inactivity or non-use. It is the observation of those who have used Pepsin, pancreatin and papoid, that they act not only as assistants to the digestive processes, but that they stimulate the gastric glands, and impart real tone and renewed functional energy. This may be in part due to the immediate improvement in general nutrition from the rapid appropriation of the more perfectly digested food. These digestives exercise a sedative influence also upon the stomach when there is nausea and irritation due to the presence of undigested food.

The partial predigestion or peptonizing of the food of infants suffering from malnutrition is now generally recognized as an almost essential process. This is accomplished by the use of tubes, each of which contains sufficient of the digestive to peptonize a given quantity of milk to which it is added. This process is adopted with invalids suffering from gastric disorder, and is advised also in preparing milk for administration per rectum, when no food can be introduced into the stomach. In this case a few grains of Pepsin added to the prepared enema, whatever its character, is of great assistance in its appropriation.

Pepsin in solution has been used to dissolve the false membrane in croup, and the exudate in diphtheria. It has also been injected into the urinary bladder to dissolve blood-clots, and applied to indolent ulcers to destroy unhealthy tissue and stimulate the surface to normal granulation.

PANCREATIN.

Occurrence—Pancreatin is found in the fresh pancreas of warm-blooded animals, and is obtained for general use from the pancreas of the hog.

This agent is usually obtained in a manner similar to the precipitation of pepsin. The glands are minced or finely cut and macerated in water to which hydrochloric acid has been added. From this acid solution the ferments are precipitated by sodium chloride. They may also be precipitated from it by adding five per cent of alcoholic solution.

CONSTITUENTS—Pancreatin is a mixture of several enzymes consisting of the ferment **trypsin**, similar to that of pepsin, proteolytic in character, but active in an alkaline medium; a starch digesting ferment—**amylopsin** resembling diastase or ptyalin; a milk digesting ferment, and a fat emulsifying ferment—**stearopsin**, closely allied to that found in the bile.

A solution of Pancreatin is prepared, called **Liquor Pancreaticus**. The fresh pancreas is finely minced and exhausted with water, strained and treated with dilute alcohol for preservation. This is often more active than the powder.

Description—Pancreatin is a grayish or yellowish amorphous powder, with a characteristic odor and taste, soluble in water, insoluble in alcohol and chloroform.

Administration—It is most active in an alkaline medium, is destroyed in a strongly acid medium, and is consequently best given from two to three hours after eating, when it assists the intestinal digestion. Dose, from two to twenty grains.

Physiological Action—It will peptonize various articles of food, such as milk, oysters, broths and gruel, and will emulsify oils and fatty foods intended for rapid nutrition.

Specific Symptomatology—**Pain** in the **intestinal canal**, beginning an hour or more after eating, and continuing for two or three hours; eructations of fatty foods; passage of undigested fats with the feces, are all indications for the use of Pancreatin.

Without these indications it may be given in the slow convalescence of wasting disease, where anorexia and malnutrition are present and not corrected by pepsin and stomach-tonics.

Therapy—The agent is of some use in **gastric inactivity**, but in the stomach, there is but little influence it may exercise that is not fully exercised by pepsin.

However, if administered at the beginning of a meal, it will sometimes exercise a full beneficial influence before enough of the gastric acids are poured out to retard its action—an influence sometimes more satisfactory than that exercised by pepsin, but as the acidity of the stomach fluids is apt to retard or destroy its influence, it is best given an hour or more after meals if there is **impairment** of the **intestinal digestion**, where it acts to the best advantage. If the stomach digestion is nearly com-

plete, a dose of magnesium or sodium carbonate or bicarbonate may be given to neutralize any excess of acid.

It will accomplish desirable results in **lienteric diarrhœa**, and in the diarrhœas of infants where there is marked emaciation, the stools containing fat cells in abundance.

Pancreatin, the liquor pancreaticus, or the powdered pancreatic glands are advised in the treatment of **diabetes mellitus**. It is possible that some benefit has followed this method of treatment in cases where the pancreas was diseased, but the author has but little confidence in it in the larger proportion of cases.

PAPAYA.

CARICA PAPAYA.

Synonyms—Papaw, Pawpaw, Melon-tree.

Part Employed—An active principle obtained from the juice of the unripe fruit.

Natural Order—Passifloraceæ.

Locality—Tropical and sub-tropical America.

Botanical Description—The Papaw tree is a cultivated tropical fruit-tree, an hermaphrodite, herbaceous, twenty feet high; trunk from twelve to fifteen inches in diameter, cylindrical; bark smooth, gray; fruit from four to six inches in diameter. The juice of the unripe fruit contains the active therapeutic principle. It is found in small quantities in all parts of the tree, but is best obtained from the unripe fruit, which yields perhaps an ounce to each single fruit. It is obtained by opening the skin by small incisions. It is of a milky character, with a slight acid reaction, and a bitterish, astringent taste. The heavier portions soon coagulate and separate, leaving a watery portion, from which the active constituents are precipitated.

CONSTITUENTS—The active principle has been variously named **papain**, **papaotin**, **papoid** or **caroid**. It is precipitated by alcohol, is a nitrogenous principle approximating in character a true albuminoid, and is associated with vegetable pectones and a milk-curdling ferment.

Description and Administration.—It is a powder of cream-white color, almost odorless and with but little taste. It is easily soluble in water and also in glycerine. Dose, from one to three grains. A larger dose may be given where immediate effects are desired, but is seldom necessary. It is sometimes advisable to repeat the dose in from one to two hours.

The natives have long had a custom of wrapping fresh meat in the leaves of the Papaw, claiming that it prevented decomposition, softening it and materially assisting its digestion. They also applied the juice to open and offensive wounds, to cleanse them and promote healing.

Physiological Action—The action of the juice upon milk coagulates it, then separates the coagulum, and finally quite quickly digests it. The active principle of the juice acts in the same manner as the juice, but more perfectly in the digestion of food. It is a vegetable digestive of extreme potency, in many cases accomplishing results not accomplished by the animal ferments. This active principle has no action on living tissue, and is nontoxic—is in fact innocuous in any reasonable quantity—although it is said to produce the death of animals if introduced into the venous circulation. It differs from pepsin in that it acts in fluids of an acid, alkaline or neutral reaction, although it acts with greater facility in an alkaline medium, exercising its maximum activity at a temperature of 132 deg. F., and in a concentrated solution.

The influence of this agent upon fats, albuminoids and starchy substances is most direct, and can be demonstrated readily in the laboratory. It emulsifies fats more promptly than other digestives, thus taking the place of pancreatin, and stimulating and assisting the intestinal digestion. We have found this exemplified strongly in that form of indigestion where the patient complains of pain in the bowels about an hour or an hour and a half after taking food. This symptom is one of the direct indications for the use of this agent, the pain often being relieved in half an hour by a single dose.

It converts the starches into maltose, etc., and peptonizes albuminoids with great facility. In addition, it stimulates the secretion of the natural digestive ferments, and induces a tonic condition of the stomach and digestive apparatus. It is antiseptic and prevents fermentation. It can also be given in conjunction with other gastric and intestinal antiseptics, with no impairment of its digestive properties.

Woodbury, writing in the *New York Medical Journal* in 1889, sums up the physiological action of the digestive principle of Papaw as follows: "It acts in alkaline solutions even better than in acid media, hence it is especially useful in indigestion due to deficient secretion of the gastric juice, or of hydrochloric acid (achlorhydria). Here an alkaline solution favors gastric digestion, both directly and indirectly: First, by digesting albuminoids and softening masses of food; and secondly, by the action of papoid in stimulating the secretion of the pepsin gland, while the alkali induces the secretion of more gastric juice. Moreover, it retards the fermentation of the undigested masses of food in the stomach, and prepares them for intestinal digestion. In fact, in such cases a compressed pill of papoid, sodium bicarbonate, and extract nux vomica, has given excellent results. Where there is excess of hydrochloric acid, and where the stomach contents, poured into the duodenum, are so acid that they prevent the action of the trypsin, papoid

prevents duodenal indigestion, by taking the place of the pancreatic ferment. It is obviously of no use to give pancreatin by the mouth, as it is at once destroyed by the acid of the stomach, and it is practically impossible to administer alkali to neutralize the excess of acid, as it would stimulate still further acid secretion. Papoid is of the greatest use here, because its activity is not materially affected by contact with acid.

Therapy—The indications for the use of papoid in treating digestive disorders may be summarized somewhat as follows:

Actual and relative deficiency of the gastric juice or its constituents. (*a*) Diminished secretion of gastric juice as a whole; aepsia, anæmia and deficient blood supply; wasting diseases. (*b*) Diminished proportion of pepsin; atonic dyspepsia; atrophy of gastric tubules. (*c*) Diminution of hydrochloric acid—achlorhydria; carcinoma. (*d*) Relative deficiency of gastric juice; overfeeding.

In gastric catarrh. (*a*) Where there is tenacious mucus to be removed, thus enabling the food to come in contact with the mucous membrane. (*b*) Where there is impaired digestion.

In excessive secretion of acid, to prevent duodenal dyspepsia.

In gastralgia, irritable stomach, nausea or vomiting.

In intestinal disorders. (*a*) In constipation due to indigestion; in diarrhœa, as a sedative. (*b*) In intestinal worms. (This claim the writer has not personally verified, but as the intestinal mucus which shields the worms is removed by papoid, it is easily understood that their removal would naturally result, or would be more readily accomplished after its administration.) Hutchinson treated tapeworm successfully with five grains of the dried juice twice daily.

In infectious disorders of the intestinal tract. (*a*) Where there is abnormal fermentation, by its antiseptic action, which may be heightened by combination. (*b*) Where there are foreign substances present, its detergent effect may be utilized in clearing these out from the intestinal canal by their digestion.

In infantile indigestion. Here papoid not only readily peptonizes cow's milk, but the resulting curds are also rendered soft and flocculent, resembling those of breast milk.

In case of obstruction of the esophagus by the impaction of a piece of meat or gristle, a paste of papoid and water produces softening in a short time."

Nearly all of the above statements have been confirmed in the experience of the writer during ten or twelve years' constant use of the agent, alternated with, but seldom in conjunction with the animal ferments.

It is a royal remedy for **general distress or pain in the stomach** and bowels during the process of digestion. It can be

prescribed almost without discrimination in these cases, and the results are in some cases surprising. It may be given during the meal, and pain not occur for an hour. At that time its influence being probably spent, another dose will continue the effects of the first. Its effects become permanent usually in acute or subacute cases after a few days, when it may be discontinued.

It is not a remedy for pain occurring before meals or after the food is digested, or for gastric pain occurring without regard to the taking of food—continuous pain and distress, since these pains are either neuralgic or organic in character. The agent is specifically one for functional disorder. It is a most valuable agent in **catarrh** of the **stomach** and in the **digestive failure** accompanying **continued fevers**. It stimulates the stomach in the beginning of convalescence, and in some cases increases the appetite and promotes absorption of the digested pabulum.

It is serviceable in the digestive **disorders of pregnancy**, stimulating appropriation and assimilation. In those cases where the digestion is seriously interfered with during the last three months of pregnancy, it being almost impossible, because of the great pain induced, for the patient to take any food into the stomach, the condition will be entirely relieved by this agent within a few days, the patient being enabled to eat large meals of meat without discomfort and with satisfaction.

The agent is a **solvent** of **fibrin**, and has been used to **dissolve false membranes**, old hardened tissue, warts and **tumors**, and has been satisfactorily applied to **epithelioma**.

Mortimer Granville reports several cases of **cancer** of the **stomach** treated very satisfactorily with this agent. In **diphtheria** the powder serves a most useful purpose in dissolving and permitting the removal of the densest exudate, which in some cases covers the pharynx and naso-pharynx, and occludes the nares. Good results have been reported by Jacobi, Hubert and others, and have come under our own observation. Kots and Asche are reported in the *Prescription* as having observed more than a hundred cases treated with success by this method.

Empirically it has been used in a few cases of **nephritic colic**, with the most marked results. It will diminish the formation of the oxalates, although in cases where tried there has been an increase of uric acid.

INGLUVIN.

Occurrence—Ingluvin is the active principle derived from the gizzard of the domestic fowl—*ventriculus callosus gallinae*. The lining structure of the chicken's gizzard is a dense, hardened membrane, surrounded by powerful muscles. The

motion of these muscles upon the contents of the gizzard is accompanied by the continuous exudation of a strong, organic fluid from glands located in the lining membrane. This fluid acts preliminarily upon the food before it reaches the gastric juices in the stomach, and also assists in the complete digestion of the food when there. It exercises in part the function of pepsin, as well as of the ptyalin of the salivary secretion.

Description—The substance occurs in scales or as a coarse granular powder, yellowish or brownish-yellow in color. It is bitter, slightly acid, and has but little odor. Dose, from three to twenty grains.

Therapy—The digestive powers of this agent are not as wide as those of pepsin, but it is efficient in cases where there is **indigestion with nausea** and gastric irritation. **Pain in the stomach**, with the above conditions, is relieved by this agent. In the deficient action of the stomach accompanied with **nausea** and **vertigo in neurasthenics** this is a useful remedy, as it certainly acts as a tonic or stimulant, increasing the functional activity of the stomach and soothing both local and reflex irritation. It is of much value in the **vomiting of infants** from local or undetermined causes. In these cases thirty grains may be stirred into half of a glass of water and a teaspoonful of this given every ten, twenty or thirty minutes. In small infants equal parts of Ingluvin and bismuth may be stirred together in the water and administered in smaller doses. It is of much efficacy in **cholera infantum** and in other protracted diarrhœas with nausea.

In the **vomiting of pregnancy** it has won its highest reputation and should be given in doses of from five to twenty grains before meals. It may be given in two ten-grain doses, one before and the other at the end of the meal, when the nausea is accompanied with indigestion. If the nausea is constantly present it may be given at any time at short, regular intervals, but with best results when the stomach is empty. In these cases when there is excessive nervous irritation with hysterical phenomena, an active nerve sedative will greatly facilitate the action of this remedy. Dilatation or mild cauterization of the os uteri may remove one of the causes of nausea, the Ingluvin afterwards quickly soothing the stomach.

When given as a digestive it should be given during or after the meals. The agent certainly exercises an influence which differs widely from that of pepsin and pancreatin, and yet is fully as important and valuable.

PINEAPPLE.**ANANASSA SATIVA.**

The fresh juice of the Pineapple contains a ferment which at a temperature of from 100 to 110 degrees Fahr., **digests proteids** readily. Both animal and vegetable albuminoid matter is reduced by it. It is related to trypsin, and forms during its action, proteolytic peptone, leucin and tyrosin. It has been named **Bromelin**, and is closely allied to the ferment found in the papaw.

It is active in either acid or alkaline media, but acts most promptly in neutral solutions. The digestion takes place rapidly, especially if the temperature be above 100 degrees.

The juice is antiseptic and destroys fungoid growths. It has been successfully used in **diphtheria**, applied directly to the exudate, which it has destroyed in a number of cases.

The juices of other trees, fruits or plants contain digestive properties to a limited extent. This is true of the fig, and of members of the Drosera family, notably of the Dionæa or Venus fly-trap.

TAKA-DIASTASE.

Occurrence—Taka-Diastase is the result of the growth, development and nutrition of a microscopic fungus, developed from the Eurotium oryzae, a mycelium of the aspergillus family. The fungus develops to the best advantage in hydrolized wheat bran. After thirty-six hours' growth at a temperature of 80 degrees Fahr., the roots of the fungi are found covered with the Diastase in the form of minute crystals.

The substance in this form converts starch into sugar, but a further process of development is essential for the conversion of the sugar into alcohol. The Diastase is soluble in water, and by washing and percolation, is separated from the bran in which its growth and development occurs. It may be precipitated by alcohol and dried and preserved indefinitely.

Description—It resembles finely broken shellac in appearance, occurring in dry or gummy particles of a light-brown color, almost devoid of taste, but producing a peculiar sensation on the tongue.

Administration—Two grains of Taka-Diastase is the usual dose, although five grains is often given. The dose is usually given in a capsule during or at the end of the meal. In liquid form one dram contains two grains.

Physiological Action and Therapy—As stated the agent possesses a diastatic and fermentative property. Its specific field is the correction of diastatic imperfections. It converts 100 times its weight of dry starch into sugar. It digests starches and

prevents constipation, flatulence, malaise, insomnia, headache and vertigo, which result from the ptomaines of undigested and decomposed starch.

While starch digestion is its direct field of action, it is found of much benefit in apepsia—in incomplete digestion from atonicity. It is found to be a most useful remedy, and yet so recently has it been given to the profession, that complete observation cannot be said to have been made. It is believed that a much wider influence will yet be found to be exercised by it than has yet been observed.

COMPOUND DIGEST.

Occurrence—The Compound Digest of Dr. Becker consists of a mixture of the enzymes found in the gastric glands of the ox, calf, sheep and pig, and those of the common wild and domestic fowls. The method of separation and preparation of these ferments was developed by Dr. Becker after many years of careful observation and experimentation. The Digest contains these ferments alone, no other substance being combined with them.

Description—The substance occurs in the form of a coarse, granular powder of a light-brown color, with a bitterish acid taste, and a slight, but characteristic odor.

Administration—Five grains is the usual dose. It may be taken during or immediately following the meals. It is sometimes advisable to administer five grains every hour, beginning with that of the meal. Added to hot water and taken before meals it will more effectually control nausea or vomiting, especially that of pregnancy and sea-sickness.

Therapy—It is applicable to any form of indigestion and has been found effectual in relieving all disagreeable results of imperfect digestion. Taken with cod-liver oil or with substances, the taste of which are apt to recur in the mouth, the digestion is so perfect that this disagreeable condition is entirely prevented. It neutralizes acidity of the stomach, prevents excessive secretion, has cured many cases of sea-sickness, relieves nausea at any time, is beneficial in the vomiting of pregnancy, and is of much service in acute or chronic diarrhoea, dysentery, cholera morbus or cholera infantum, where perfect digestion is essential.

Note—Other well known assistants to digestion are hydrochloric acid, described in another chapter, the malt extracts, lactopeptine and peptenzyme. The two latter preparations are proprietary, and the writer has no perfect knowledge of their composition, although they have served him an excellent purpose at times. Those described are in common use.

GROUP V.

Agents Acting Upon the Intestinal Glandular Organs, and Upon the Intestinal Canal.

CHAPTER I.

Laxatives and Correctives.

CASCARA.
RHEUM.

ALOES.
SENNA.

CASTOR OIL.
OLIVE OIL.

CASCARA SAGRADA.

Synonyms—*Rhamnus Purshiana*, chittem bark, sacred bark, Bearberry, bear-wood.

Part Employed—The bark.

Natural Order—*Rhamnaceæ*.

Locality—Pacific slope of North America, California, etc.

The introduction of this important and most valuable agent into medicine and its officinal recognition by the United States, British and Austrian Pharmacopœias is due to the indefatigable energy of Parke, Davis & Co., of Detroit, who persistently insisted not only upon its virtues being recognized, but upon the recognition and general acknowledgment of its discoverer, Dr. Bundy, of the Eclectic School.

Botanical Description—The tree from which Cascara is obtained, is the largest tree of about sixty species of the genus *Rhamnus* or Buckthorn family. In the forests of the western slope of the United States its usual height is about thirty-five or forty feet, although it often grows to the height of seventy feet, and from twelve to eighteen inches in diameter. Its wood is light, very hard, not strong, close-grained, compact, satiny; medullary rays numerous, thin; color, light-yellow of a brownish tint, the sap wood is somewhat lighter.

Its young branches are tomentose; its leaves broadly elliptical, two to seven inches long and from one to three inches wide, mostly acute, obtuse at base, regularly denticulated except at the base, deciduous, somewhat pubescent beneath, lateral veins fourteen to sixteen, prominent; flowers ten to twenty, perfect, rather large, in a somewhat umbellate cyme, pentandrous; anthers yellowish; sepals five; styles united to the summit; stigmas three; petals minute, cucullate, bifid at the apex; peduncles longer than the petioles, pubescent; fruit

black, broadly obovoid, four lines long, three-lobed, three-seeded.

CONSTITUENTS—There is present a crystalline, bitter principle and three distinct resinoid bodies, not bitter, which are believed to be derived from chrysophanic acid which is thought to be present in the bark.

PREPARATIONS—Fluid Extract *Cascara Sagrada*, not miscible with water. Dose, as a stomachic tonic and function restorer, three to ten minims; laxative five to twenty minims four times a day; as a cathartic, twenty to sixty minims morning and evening.

Solid Extract *Cascara Sagrada*. Dose, as a laxative, one-half to two grains; as a cathartic, three to eight grains.

Powdered Extract *Cascara Sagrada*, produced by evaporating the solid extract at a low temperature and triturated with sugar of milk, same strength as the solid extract.

Cascara Cordial with elimination of the bitter principle. Dose, half a dram to a dram and a half.

Physiological Action—Dr. Bundy, the discoverer of *Cascara*, writing in 1878 says: "I employ a fluid extract of *Cascara*, using one ounce in a four ounce mixture in combination with other remedies or alone, as the case may require. It acts upon the sympathetic nervous system, especially upon the solar plexus, stimulating the nutritive and assimilative forces, increasing the digestive processes generally. It acts upon the secretory system in a marvelous manner, especially where the secretions are deficient and perverted, and this seems to be one of its special indications. Constipation depends upon the nature of the diet, deficiency or a faulty composition of the intestinal secretions, disordered glands that pour their secretions into the intestines, impairment of muscular power, which leads to a deficiency in their propelling power which may result from nervous or mechanical influences, congestion of the portal circulation, normal secretion of intestinal juices interfered with, deficiency in biliary secretions of a healthy character, congestion of mucous membrane of intestines, and last and the most frequent, constipation which has been caused by resisting the calls of nature from carelessness or circumstances that prevent obedience at the proper time."

Scheltzeff in 1885 (*London Med. Record*) made the following observations: "In doses from four to ten cubic centimetres (with double quantity of water), *Cascara Sagrada* excites the secretion of gastric juice and increases it during digestion. It increases also the secretion of the pancreatic juice. It excites and increases the secretion of bile. It has no action on the secretion of saliva. It has not led to any rapid and considerable evacuations."

Cascara is a bitter tonic of specific value in its direct influ-

ence upon the function of the stomach and intestinal canal. It acts upon the vasomotor system, stimulating the glandular apparatus of the intestinal tract to more perfect secretion, and increasing peristaltic action. It is especially indicated in torpidity or atonicity, quickly restoring functional activity.

It is not a cathartic in the common acceptation of the term, but by restoring normal function, by its tonic influence, bowel movement of a natural character follows.

It does not mechanically liquefy and empty the intestinal canal, but it restores normal elasticity and tone to the relaxed structures, and natural vermicular motion and peristaltic action, exercising a direct influence upon muscular structure of the intestinal walls. It materially influences the venous and capillary circulation of the entire intestinal tract thus proving of much value in hemorrhoids.

Administration—In prescribing Cascara for the cure of **chronic constipation**, large doses at the first are undesirable. If a single dose, so large as to produce a cathartic effect be administered, subsequent small doses will prove insufficient to restore tone, and the constipation will remain unless the large dose is constantly repeated. If a dose of from two to ten drops in a proper vehicle be given, three, four or five times daily for many days, even if the constipation does not at first yield, the effects after a few days are most salutary. There is a normal movement in the morning and the habit of regular evacuation can be soon fixed, and as the agent is continued the dose may be slowly decreased until a single drop at each dose is given. Finally, a single small dose morning and night may be continued for a time and then stopped, the bowels continuing their normal action.

If constipation pre-exists, it is well to give a simple laxative or to flush the bowels thoroughly before beginning its use to overcome the chronic condition. The results can be sooner obtained also by smaller doses.

Therapy—Large doses of the agent produce colic and are seldom needed. In the temporary **constipation of pregnancy**, or in the convalescence of acute disease, doses of from one-fourth to one-half dram in a tonic mixture, preferably of malt extract, taken at the bed hour will be most satisfactory. Often a single dose followed by a glass of cold water on rising will have a salutary effect. This is true of constipation extending over a short period, not necessarily chronic. To produce an immediate effect as a physic, a dram of the fluid extract should be given, and it will probably induce some pain. The agent should not be used in this active form for its immediate effects during the pregnant term, as its irritating influence may be sufficient to produce miscarriage.

Cascara in medium doses is an efficient agent in **gastric** or

intestinal catarrh. It quickly restores the normal tone of the mucous membranes, suspending undue secretion and acting in perfect harmony with other measures adopted.

It is a useful remedy in many cases of **chronic indigestion** and in chronic disease of the liver. It has been used in **cirrhosis** with the best of results. It is useful in **jaundice** with deficient excretion of bile, and corrects catarrh of the bile duct. It is useful in **diarrhœa**, subacute or chronic, depending on deficient liver action, and upon catarrhal and atonic conditions of the intestinal tract.

In 1886 quite an interest was excited by the assertion of Goodwin, of New York, that Cascara was an excellent remedy for **rheumatism**. Many experimented with it and some reported excellent results, but its use for this purpose has not been continued. It is, however, of much value in the treatment of those cases where gastric and intestinal disorders are present, given in conjunction with more specific agents.

RHEUM.

RHEUM OFFICINALE.

Synonyms—Rhubarb, Chinese or Turkey Rhubarb.

Part Employed—The root.

Natural Order—Polygonaceæ.

Locality—China, Thibet.

Botanical Description—Rhubarb from which the officinal drug is obtained is a perennial herb, similar to garden rhubarb, but much larger, flowering in May and June, and is not collected till it has attained the age of six years; stem four to six inches thick, much branched; branches ten to fifteen inches long, three to six inches thick, dark-brown, succulent; flowering stems five to ten feet high, hollow, green; leaves spring from a distinct crown rising some inches above the surface of the ground; petiolate subcylindrical, pubescent; petioles twelve to eighteen inches long; lamina orbicular, cordate at base, shortly five to seven-lobed, coarsely and irregularly dentate, four to four and a half feet long; flowers in long branching panicles composed of numerous flowers, one-fourth inch long, greenish-white; fruit in clusters, one-half inch long, one-fourth inch broad; root of commerce in cylindrical, conical or flattish segments, deprived of the dark-brown, corky layer, smoothish or somewhat wrinkled, externally covered with a bright yellowish-brown powder, marked with white elongated meshes containing a white, rather spongy tissue, and a number of short, reddish-brown or brownish-yellow striæ; compact, hard; fracture uneven; internally white, with numerous red, irregularly curved and interrupted medullary rays, which are radically parallel only near the cambium line; odor peculiar, aromatic; taste

bitter, astringent; when chewed feels gritty between the teeth, and stains the saliva yellow. Rhubarb that is very porous and of a prominently mucilaginous taste, or dark-brown internally, should be rejected. (U. S. P.) Solvents, alcohol, water. Dose, from five to thirty grains.

CONSTITUENTS—Chrysophan, phæoretin, erythrorrhætin, aporetin, chrysophanic acid, rheotannic acid, emodin, gallic acid, rheumic acid, calcium oxalate, sugar, starch, salts.

PREPARATIONS—Extractum Rhei, Extract of Rhubarb. Dose, from ten to fifteen grains.

Extractum Rhei Fluidum, Fluid Extract of Rhubarb. Dose, from a half to two drams.

Syrupus Rhei et Potassæ Compositus, Compound Syrup of Rhubarb and Potassa, Neutralizing Cordial. Dose, from one to four drams.

Specific Rheum. Dose, from one to twenty minims.

Physiological Action—The influence of this agent is peculiar. It is a laxative first, cathartic if in extreme doses, and subsequently astringent. It tones the gastro-intestinal tract to a marked degree, if debilitated, and if over-activity is present, the agent restrains that condition.

It mildly and satisfactorily evacuates the bowels without irritation or stimulation. Some individuals eat a few grains of the crude root, which they carry in the pocket, every day for chronic constipation, others are not benefited with large doses.

Therapy—In **atonic conditions** of the **bowels**, with debility or general relaxation, whether **diarrhœa**, **dysentery**, **cholera morbus** or **cholera infantum** is present, it is a most useful remedy. Its tonic powers are promptly exercised, and properly combined with indicated remedies, it produces markedly restorative effects. It acts directly upon the duodenum, and subsequently upon the entire intestinal tract. It is the laxative for debilitated patients, or for patients recovering from prostrating disease.

Given to a nursing mother, like aloes, it relaxes the infant's bowels, and in some cases it is desirable to administer it to the mother for this purpose.

SYRUPUS RHEI ET POTASSA COMPOUND.

Synonyms—Syrup of Rhubarb and Potassa Compound, Neutralizing Cordial.

This old Eclectic formula has attained to such a wide notoriety, is in such general use in our own school, and is now so popular among the regular physicians and so generally adopted by them, that it deserves a conspicuous place in this book. It has no superior in medicine, as restorative to acute abnormal conditions of the stomach or bowels demanding an antacid. Prof. King's original formula is as follows, which happily combines the active virtues of its constituents:

Formula—Best India Rhubarb, Golden Seal Cinnamon, each *one ounce*; Refined Sugar, *four pounds*; Brandy, *one gallon*; Oil of Peppermint, *twenty minims*. Macerate the Rhubarb, Golden Seal and Cinnamon, in half a gallon of the Brandy for six hours, with a gentle heat, then transfer the mass to a percolator and displace with the remaining half-gallon of Brandy. The remaining strength, if there be any, can be obtained by adding water until the liquor comes off tasteless. To this add the Carbonate of Potassa, Sugar and Oil of Peppermint, this last having been previously rubbed with a sufficient quantity of the Sugar to absorb it, and mix the two liquors. The whole of the active properties of the ingredients may be obtained with more certainty by using Alcohol, seventy-six per cent, instead of Brandy, owing to the great want of uniformity in the quality of the latter.

Dr. H. L. Clark, of Chicago, who is expert in the manufacture of this syrup, adds nearly double the quantity of sugar advised in this formula, and by care removes the characteristic taste of the potassium, securing a most elegant and pleasant tasting preparation. This syrup improves also to a certain extent with age.

Administration—The syrup is given in doses of from half a dram to half an ounce, usually diluted with considerable water.

Therapy—While we advocate the use of single remedies for direct effects, we have obtained such marked results from this combination that we are impelled to teach students its use, especially in children's gastric disorders. A **sour stomach** is always benefited by it. It is specific when the tongue is coated uniformly white, and is broad, and the mucous membranes are pale, when there are eructations of sour gas or vomitings of acid matter. It never fails in these cases. It makes no difference whether there is diarrhoea or constipation.

A stomach filled with sour decomposed food can appropriate no medicine, and all specific remedies demand a stomach free from these conditions.

This agent neutralizes excessive acidity without liberation of carbonic acid gas; it stimulates and soothes the stomach and promotes normal action.

It may be given to neutralize excessive acidity before general medication is begun in any case.

It is the remedy for children's summer disorders *par excellence*. It is a safe remedy to use *ad libitum* in the family for deranged conditions of the stomach and bowels.

A tablespoonful, taken by an adult in summer when nausea, colic or diarrhoea declare a derangement of the organs of digestion, will usually immediately restore the normal condition. It is palatable and pleasant to children, especially if diluted. In fevers from gastric acidity the treatment should be begun

with this syrup, the indicated remedies being given when excessive gastric acidity is in part neutralized and the normal condition stimulated by the Rhubarb. It may be added to the vehicle in prescriptions for stomach and bowel troubles of an atonic character.

If constipation is present a mild laxative may be added. If much diarrhoea is present an astringent, such as geranium or epilobium will increase its value, and if there is extreme lack of tone, its value is enhanced by the tincture of xanthoxylum or capsicum. If there are sharp colicky pains, a few drops of the tincture of colocynth or the tincture of ginger, or even paregoric, or deodorized opium in severe cases, will be found valuable. It should be in constant use by every physician in stomach and intestinal disorders common during the heated term.

ALOES.

ALOES SOCOTRINA.

Synonym—Aloe Perryi.

Part Employed—The inspissated juice.

Natural Order—Liliaceæ.

Locality—South Africa, East Indies, India.

Botanical Description—The Aloes of commerce is the dried juice of several species of Aloe, a plant resembling the American Aloe or century plant, and found growing in South Africa, India and the East Indies, and is known according to the commercial source as Socotrine, Cape and Barbadoes Aloes. The source of Socotrine Aloes, which is the best variety, is the Aloe Perryi, named for Mr. Wykeham Perry, who first described it. It is a plant with a stem two feet high, very rough from leaf-scars, naked below; leaves green, ensiform, amplexical, curved inward at the point, thick, with many white serratures at the margin; flowers arranged in racemes, greenish at the apex, whitish in the middle and scarlet below; corolla campanulate; petals three, ovate, obtuse; sepals narrower than the petals; stamens longer than the corolla, and of unequal length.

Socotrine Aloes is in pieces of a yellowish-brown or ruby-red color, and becomes darker on exposure to the air; surface glossy, fracture smooth; powder a bright yellow; odor saffron-like; taste aromatic, bitter. Dose, two to five grains.

Cape Aloes has a brilliant conchoidal fracture and a dark, olive-green color; while Barbadoes Aloes has a dull fracture and a dark brown or black color as distinguishing characteristics.

The mode of preparation of Socotrine Aloes is unknown, but is supposed to be inspissated by spontaneous evaporation.

In preparing Barbadoes and Cape Aloes the leaves are cut off near the base and placed on an inclined surface, from which

the juice flows into a suitable vessel. When a sufficient quantity of juice is collected it is poured into an iron kettle and boiled with little care to a proper consistence.

Aloe purificata, purified Aloes. The Aloes of commerce is melted in a water bath, with alcohol added to make it more liquid, and strained so as to remove fragments of wood and other accidental impurities.

CONSTITUENTS—Aloin, resin, volatile oil.

Aloinum, Aloin. This is a crystalline substance obtained from Aloes, of a yellowish-brown color; odorless and with the taste of Aloes. It is twice as active as Aloes and produces less griping. Dose, from two to five grains.

Physiological Action—It is not rapid or so severe in its action as some other cathartics. Given at bedtime it operates upon rising in the morning. The action is not painful, and it increases the alvine discharges without any increase of the watery constituents. It increases the circulation of the blood in the intestine, improves the muscular tone and restores normal peristaltic action.

Therapy—If administered to a nursing mother it will produce a cathartic effect upon the infant. It is a constituent of the larger proportion of the cathartic pills on the market.

If the liver is acting normally a much less dose will produce a cathartic effect than when there is a torpid or an inactive liver.

The agent should be used, if at all, with much care in inflammatory conditions, especially if those of the intestinal canal, as it is an irritant to the lower bowel, and it increases the heart's action and the circulation of blood and raises the temperature.

The agent is emmenagogue and abortive in its action and should not be given during pregnancy. It will produce a full menstrual flux in some cases of suppression.

SENNA.

CASSIA ACUTIFOLIA.

Synonym—Alexandria Senna.

Part Employed—The leaflets.

Natural Order—Leguminosæ.

Locality—East and Central Africa, India.

Botanical Description—*Cassia Acutifolia* is a small shrub two to three feet high; stem erect, branching, woody, whitish; leaves alternate, pinnate, with glandless footstalks, stipulate; leaflets lanceolate, one to two inches long, two-fifths of an inch broad, sub-coriaceous, brittle, four to six pairs to each leaf, acute, oblique at base, entire, grayish-green, pubescent, nerved; flowers yellow in axillary racemes; fruit flat, oblong, smooth, membranous, indehiscent, grayish-brown, bivalvular legume, two inches long, three-fourths inch wide, bivalvular, six or

seven celled, each containing a hard, cordate, ash-colored seed. Solvent, water, alcohol. Dose, of leaflets, half a dram to three drams.

CONSTITUENTS—Cathartic acid, Sennacrol, sennapicrin, chrysophan, phæoretin, cathartomannit, mucilage.

PREPARATIONS—Confectio Sennæ, Confection of Senna. Dose, one to two drams.

Extractum Sennæ Fluidum, Fluid Extract of Senna. Dose, half to one dram.

Infusum Sennæ Compositum, Compound Infusion of Senna. Dose, one to three ounces.

Pulvis Glycyrrhizæ Compositus, Compound Powder of Liquorce. Dose, twenty to sixty grains.

Pulvis Jalapæ Compositus, Compound Powder of Jalap. (A. D.) Beach's Antibilious Physic. Dose, one dram.

Specific Senna. Dose, from one to thirty minims.

Therapy—Senna is an efficient remedy, mild, kindly, certain and uniform in its action. It is a constituent of the larger number of the proprietary laxative or cathartic compounds, syrups, cordials or elixirs.

It is used in all cases of **temporary constipation**, however induced. An infusion of the leaves is not unpalatable and is promptly active. It produces normal evacuations of the bowels and if used carefully there is but little griping. It is used after surgical operations, after confinement, in the constipation of the feeble, and in many cases of inactive bowels among infants and children. It is not used where a powerful derivative is needed, or where active cholagogue or hydragogue influence is demanded. It has a narrow but important sphere.

Co-Operatives—In combination with ginger, capsicum or black pepper it is useful in atonic conditions with inactivity of the bowels. With magnesium sulphate, or potassium bitartrate, it will induce more of a hydragogue effect. In combination with leptandra it acts more specifically upon the liver; with jalap and ginger it was long known as **antibilious physic** and was given whenever "biliousness" was diagnosed; with rhubarb and peppermint it is a tonic, laxative and carminative, of greatly improved value. It is the active constituent of the well known and popular, **Compound liquorice powder**.

The composition of this powder is as follows: Senna and liquorice in fine powder, of each two ounces; fennel fruit, sublimed sulphur, of each one ounce; refined sugar, six ounces. Mix thoroughly. Dose, from one-fourth to one dram in water.

The following is an excellent simple laxative:

A strong infusion of Senna leaves is made and strained. In the clear liquid good French prunes are stewed until thoroughly cooked. One of these three or four times daily will overcome many cases of constipation, especially when the tendency is

only temporary, or due perhaps to other conditions, temporary in their character, as during tedious convalescence.

Figs and Senna leaves, chopped together finely, have been long in use for laxative purposes.

RICINUS.

RICINUS COMMUNIS.

Synonym—Castor Oil Plant.

Part Employed—A fixed oil from the seeds.

Natural Order—Euphorbiaceæ.

Locality—India. Cultivated in other countries.

Botanical Description—The *Ricinus Communis* of the East Indies attains the size of a tree, but in our temperate latitude it is a herbaceous annual plant, flowering in July and August; stem five to ten feet high, hollow, round, glaucous, purple above, branching; leaves alternate, palmately seven or nine-lobed, pellate, serrate, smooth on both sides, bluish-green; flowers monœcious, on jointed peduncles, forming a pyramidal terminal raceme, the lower flowers male, the upper female; fruit capsule subglobose, grooved, with three projecting sides covered with tough spines, three-celled, each cell containing one seed, maturing, the capsule bursting in August and September; seed one-half inch long, one-fourth inch broad, one-eighth inch thick, grayish with blackish spots on bands, smooth, shining.

CONSTITUENTS—A fixed oil ricinoleic or ricinic acid, ricinolein, palmitin, starch, mucilage, sugar.

PREPARATION—In the preparation of Castor Oil the seeds are crushed, kiln-dried, and subjected to a powerful pressure to remove the oil, which is heated in water to remove albuminous matters and drawn off into barrels.

Cold-pressed Castor Oil, *Oleum Ricini*, is viscid, nearly or quite transparent, with a mawkish odor and an offensive taste. Dose, from one to eight drams.

Administration—The taste of Castor Oil is disgusting to many and unpalatable to all. It is partially disguised when the dose is added to a teacupful of hot milk and well stirred. Hot lemonade or hot coffee disguises its taste to a certain extent. Wine, ale and beer are suggested, probably because of a love for such auxiliaries.

Therapy—As a **cathartic** in domestic practice this agent has long taken first rank. Children are susceptible to its action. An ununction of the oil over the abdomen is usually sufficient to produce a full laxative effect in babes. It may be continued from day to day for the cure of **chronic constipation** in young children. A kneading or rubbing of the bowels will stimulate peristaltic action and increase the influence of the oil.

When **nervous irritation** in children occurs with **fever**, from undigested food or irritating substances in the stomach or bowels, a dose of Castor Oil sufficient to produce free evacuation without pain may be given at once. Its action will usually remove the irritating causes, and the fever and nerve irritation will quickly subside. **Diarrhœas** induced from such causes are at once controlled after its operation. It has a secondary action like rhubarb, and constipation usually follows its use for a day or two.

In the treatment of **dysentery** it is good practice to thoroughly evacuate the bowels with Castor Oil and to follow it with full doses of sweet oil. In infants the sweet oil alone may be sufficient. If the oil is administered early in the case and followed with the suggested remedies the disease often abates at once.

It seems in itself to exercise a mild sedative effect, not only that it quiets distress in the bowels and removes irritating substances, but it promotes quiet and sleep.

It is used in a few cases after surgical operations, after **labor** on the second or third day, and after taking **vermifuges**, and whenever a simple, prompt agent is needed to evacuate the *primæ viæ*.

OLIVE.

OLEA EUROPÆA.

Part Employed—A fixed oil from the pericarp.

Natural Order—Oleaceæ.

Locality—Western Asia.

Botanical Description—The Olive is indigenous to Western Asia, but is now cultivated in the Southern United States and California. In its wild state it is almost shrubby, but under cultivation it is a medium-sized tree. The Olive tree is an evergreen fifteen to twenty feet high, sometimes much larger; stem solid, erect, branched; bark grayish-white; leaves short petiolate, opposite, lanceolate, acute, entire, coriaceous, two to two and a half inches long, glaucous, green above, silvery white beneath; flowers small, creamy white, numerous, in axillary racemes, about half as long as the leaves; fruit a smooth oval drupe, size of a damson, purple, two-celled; sarcocarp firm, fleshy, oily; putamen hard, thick, ovoid, one-seeded.

CONSTITUENTS—The sarcocarp contains 70 per cent of fixed oil.

PREPARATIONS—The recently collected ripe Olives are crushed into a pulpy mass, and subjected to pressure, care being taken not to break the stones, the oil being collected in a cistern containing water, from the surface of which it is subsequently skimmed.

This yield is the virgin oil of commerce. The resulting oil cake is subjected to further treatment, yielding an inferior oil. Olives are allowed to ferment before crushing, which method yields a greater quantity, but an inferior quality of oil.

Olium Olivæ, Olive Oil. This is a pale-yellow oily liquid having a slight odor and an agreeable, nutty, oleaginous taste. Solvents, ether, chloroform. Dose, from one dram to half an ounce.

Pharmaceutical Preparations—Sapo, Soap (Castile Soap); Emplastrum Saponis, Soap Plaster; Liniment Saponis, Soap Liniment.

Therapy—Olive Oil is an excellent nutritive and laxative for children. It must be given in doses of one or two table-spoonfuls. It can be flavored and rendered palatable. It may be given whenever **irritating substances** are retained in the intestinal tract, and when **convulsions** are present from gastrointestinal irritation. It can do no harm. Violent and profound **convulsions** with **acute enteritis**, from swallowing the seeds of grapes, have been controlled at once by the writer, with large doses of sweet oil internally, and by using rectal injections of the oil very warm, large quantities of the seeds being removed and the local irritation soothed.

It is now generally used internally and externally in the treatment of **appendicitis**, and it is a most efficacious remedy. It is given freely internally at regular intervals, and after its external application heat is kept constantly applied. Indicated remedies for the fever and for the prominent symptoms should not be overlooked.

It is of much value in the removal of **biliary calculi**. In these cases from six to twelve ounces is the necessary quantity for administration, repeated three or four times daily. The influence is often pronounced.

It is an excellent agent in **dysentery**, whether of infants or adults. It may be given per orem, and a quantity subsequently injected into the rectum after a bowel movement. If for an adult, two ounces, into which ten drops of laudanum has been rubbed, is injected, often the distress is so relieved that it need not be repeated.

The injection of sweet oil is essential in **impaction** of the **feces**, and where there is great deficiency of intestinal secretion, or where **scybala** form, or where there are **ulcers** or fissures and great pain is induced by the presence of fecal matter in the rectum.

A feeble, newly born infant may be quickly bathed in warm sweet oil and wrapped in cotton, and surrounded by heat and not dressed for several days. The oil can be wiped off once daily with a soft linen cloth and fresh warm oil applied. In healthy infants it is better to apply warm oil freely, wipe it off

once and apply more. The child should then be wrapped in warm wrappings and not dressed for twenty-four hours.

Sweet oil is the best of lubricants, and the carbolized oil is used for chafing, and upon hands and instruments in surgery, and in vaginal examinations, and in introducing bougies or catheters. If a stream of warm oil be forced into the urethra in spasmodic stricture just in advance of the catheter, the dilation may be made satisfactorily, and the catheter may be introduced when that act was previously impossible.

Olive Oil is exceedingly valuable in the treatment of sprained, bruised or contused parts, applied warm on absorbent cotton and kept hot. It acts as nutrition to the part, diffuses the heat and is markedly soothing in its influence.

Sweet oil is used to protect the mucous surfaces of the esophagus and stomach when poisoning has occurred from the caustic alkalies. It also forms a neutral innocuous soap with the alkali and can subsequently be removed. With acids it is of no service. In some cases a fatal loss of time occurs from depending upon this, when magnesia or lime water or soda or a soap solution should have been introduced to neutralize the acid.

CHAPTER II.

Agents Used as Liver Stimulants.

PODOPHYLLUM.
LEPTANDRA.

IRIS.
CHIONANTHUS.
CHELIDONIUM.

MERCURY.
SODIUM PHOSPHATE.

PODOPHYLLUM.

PODOPHYLLUM PELTATUM.

Synonym—Mandrake.

Part Employed—The rhizome and roots.

Natural Order—Berberideæ.

Locality—United States.

Botanical Description—The mandrake is a perennial herbaceous plant, growing in rich woodlands and flowering in May and June; stem about one foot high, simple, round, smooth, erect, pale-green, divided at the top into two round petioles, about six inches long, each petiole supporting a single leaf; leaves peltate, palmately five to seven-lobed, four to six inches in diameter, coarsely dentate at the apex, glaucous, green above, pubescent beneath; flower nodding, solitary, on a long peduncle springing from the fork of the stem, white, two inches broad; petals six to nine; stamens twelve to eighteen, hypogynous; anthers oblong; ovary compressed, oval; fruit yellow, with brownish spots when ripe, size of a pullet's egg,

pulpy, sweet, edible, ovoid-oblong, one-celled, containing twelve seeds imbedded in the pulp of the large parietal placenta; rhizome jointed, dark-brown, about twice the size of a goose-quill, three to six feet long, giving off numerous light-colored fibers at the joints, each joint enlarged to half an inch in diameter, globular in shape, with a stem-scar above; yellowish-white internally; mealy, with a circle of small wood bundles; pith large, compact, nearly inodorous; taste sweetish, bitter, acrid; rhizome should be collected in October or November, soon after the ripening of the fruit. Solvents: alcohol, water in part. Dose, from five to fifteen grains.

CONSTITUENTS—Picropodophyllin, picropodophyllic acid, podophylloquercetin, gum, starch, gallic acid, volatile oil, fixed oil, salts.

PREPARATIONS—Extractum Podophylli Fluidum, Fluid Extract of Podophyllum. Dose, from five to ten grains.

Resina Podophylli, Resin of Podophyllum, Podophyllin. Dose, one-eighth grain.

Specific Podophyllum. Dose, from one-fourth to ten minims.

This exclusively Eclectic remedy has occupied a prominent place in our literature for nearly seventy years. John King isolated Podophyllin as a resinoid in 1833, and published a report of his method and observations on the remedy in 1844 in the Philosophical Medical Journal of New York. Following King's suggestions, Lewis made an analysis of the drug in 1847 which was first quoted by the U. S. Dispensatory in 1854, twenty-one years after King had first isolated the resinoid. It was called by the Eclectics of that time vegetable calomel because it was used to replace calomel in their therapeutics.

In malarial country regions this agent will be more often indicated than in the city, as the habits of city life are more apt to induce extremely opposite conditions to those which indicate Podophyllin.

Administration—The physiological action does not suggest to a great degree the uses which our experience has taught us to make of this remedy. The drastic cathartic influence we do not need, as it is too harsh in its active influence. From five to thirty drops of the tincture in a four ounce mixture, or from $\frac{1}{200}$ to the $\frac{1}{20}$ of a grain of Podophyllin, will be found sufficiently active.

Specific Symptomatology—This agent is demanded in inactive conditions of the gastro-intestinal tract, indicated by a heavily coated tongue, which is thick, broad and pale, and the coat of a dirty yellow color especially at the base, together with perhaps vertigo, complete anorexia, and dull heavy headache. The circulation is full and sluggish and the abdominal viscera are in a plethoric condition.

Therapy—These conditions will suggest the use of the agent

whatever the name of the existing disease. In acute inflammatory conditions, or in irritable conditions of the stomach or bowels, it is contra-indicated in active doses.

In the condition known as **biliousness**, with markedly inactive liver, sallow skin and conjunctiva, constipation, highly-colored urine containing uric acid, urates in great excess and bile, it is of value. In these cases the following formula, although unpleasant to the taste, will be of great service:

Tincture of Podophyllum, Tincture of Leptandra, of each half a dram; Tincture of Capsicum twenty minims; Syrup of Liquorice, half an ounce; Port wine sufficient to make four ounces. Give a teaspoonful every two or three hours.

If there is **enlargement** of the **liver**, with general indisposition, soreness over the liver and pain through the right side and under the right scapula, it is the remedy.

In inactivity of the liver characterized by **constipation**, the feces when passed being solid or hard and of a grayish or clay color, and floating upon water, with general indisposition, Podophyllin may be given in doses of one-fiftieth of a grain every two or three hours. If there is great sluggishness with obstinate constipation, one-tenth of a grain may be given for two or three doses, the smaller doses to follow. It is given in **jaundice** with its marked indications to excellent advantage. If given for its cathartic influence it should be combined with hyoscyamus or belladonna, or it may be given in conjunction with leptandra virginica.

Podophyllin, in from one-half to one grain doses repeated once or twice, and followed by half a pint of pure olive oil, is reasonably sure treatment in the removal of **gall stones**. The results may be painful, but the patient will have subsequent relief.

The agent in minute doses will permanently cure some conditions which cause **chronic constipation**, but if desired for this purpose, like cascara, it must at no time be given in full active doses. Locke advises a teaspoonful of a mixture of thirty grains of the second decimal trituration in a half glass of water to be given a child three times each day for constipation.

In minute doses it will stimulate intestinal secretion and peristaltic action in children, and overcome **dry stools**, and constipation and bloated bowels, with erratic colicky pains.

In the treatment of **hemorrhoids** accompanied with constipation from deficient peristalsis and general abdominal plethora, Podophyllum is of direct service. It can be given in conjunction with collinsonia and the effects are marked from the first.

The writer has prescribed the tincture or fluid extract of Podophyllum for several years as an **alterative**. If the plethoric conditions named as indicating it are present, it is much more

active, and is always to be given in doses sufficiently small to avoid any irritating or cathartic effects. In **skin diseases** of childhood, such as cracked and fissured conditions of the skin of the face, or **eczema**, or persistent **pustular conditions**, it is of value.

It may be prescribed with most happy results with other alteratives in **scrofula** or **syphilis**, or in the eruptions which result from these disorders.

Younkin is authority for the use of this agent in one-sixth of a grain doses, with ten grains of the potassium bitartrate, given every two hours in **gonorrhœal epididymitis**, of which it relieves the pain and abridges the inflammation. Other indicated remedies are, however, not to be overlooked. It may be given with confidence in this condition.

LEPTANDRA.

LEPTANDRA VIRGINICA.

Synonyms—Veronica Virginica, Linne; Culver's Root.

Part Employed—The rhizome and rootlets.

Natural Order—Scrophulariaceæ.

Locality—United States, Canada.

Botanical Description—Leptandra Virginica is an indigenous perennial herb growing in low grounds and rich woodlands throughout the United States, east of the Mississippi, and flowering in July and August; stem simple, straight, smooth or downy, herbaceous, obtusely angular; leaves in whorls, short-petioled, lanceolate, serrate, acuminate, glaucous beneath; flowers whitish, nearly sessile, in paniced subterminal spikes, three to six inches long, bracts very small; calyx four-parted; corolla small, nearly white, with a deeply four-cleft spreading border, the lower segments narrower than the others, pubescent inside, tubular, the tubular part much longer than the calyx, and longer than its border; stamens two, extending much beyond the corolla; fruit small, oblong capsule, not notched, opening by four teeth at the apex, many-seeded; rhizome perennial, horizontal, irregular, woody, four to six inches long, about one-fourth of an inch thick, somewhat bent and branched, blackish externally, brown internally, with many long, slender, dark fibres issuing horizontally in every direction; when fresh it has a faint almond-like odor, and a bitter, nauseous taste. Solvents, alcohol, water. Dose, from fifteen to sixty grains.

CONSTITUENTS—Leptandrin, resin, saponin, tannin, mannite, gum, citric acid, volatile oil.

PREPARATIONS—Resin of Leptandra, Leptandrin. Dose, from one-fourth to one grain.

Extractum Leptandræ Fluidum, Fluid Extract of Leptandra.
Dose, from twenty to sixty minims.

Specific Leptandra. Dose, from one to twenty minims.

Specific Symptomatology—**Malaise** from malarial influence, soreness on deep pressure in the right hypochondrium, with wide dullness on percussion, constipation, full abdominal tissues with inactive intestinal glands, torpor of the liver, anorexia, dull headache. Also in cases in which there are marked vertigo, cold extremities and cool skin, dull pain in the bowels, gloominess or mental despondency and depression, disinclination to work or even move, great lassitude.

Therapy—In **malarial conditions** no cathartic is more efficient than Leptandra. It may be given in full doses, and there is no irritation from its action. It certainly increases the discharge of bile and stimulates and greatly improves the function of the liver.

In **ague** when quinine is given as an antiperiodic, if from one-fourth to one grain of Leptandra be given with each dose in the intermission, the effects are much more marked and the influence is more permanent. It is demanded in **malarial fevers** of all kinds, and especially in remittent fever. It is given alone at the onset of the attack as a laxative and in the remission, in small doses in conjunction with the antiperiodic, proving a most valuable auxiliary to the treatment. As an addition to vegetable tonics when malarial conditions prevail, it improves the **tone** of the entire **gastro-intestinal canal** and increases the functional activity of the **glandular organs**. In some cases small doses in wine will produce excellent results.

In the treatment of **jaundice** it is a valuable auxiliary, and combined with the tonics here indicated its influence is most desirable. It clears the skin, produces black alvine evacuation, and assists in overcoming the entire train of symptoms.

Leptandra has no superior in a case of this character and must be used freely to be appreciated. It is certainly underestimated.

IRIS.

IRIS VERSICOLOR.

Synonym—Blue Flag.

Part Employed—The rhizome and roots.

Natural Order—Iridaceæ.

Locality—North America.

Botanical Description—Blue Flag is a perennial plant growing in wet, swampy places from Newfoundland to Florida, and flowering in May and June; stem two to three feet high, round on one side, acute on the other, branched; leaves about a foot

long, half an inch to an inch broad, sword-shaped, sheathing at base, striated, erect; flowers two to three inches long, funnel-shaped, from two to six in number, usually blue or purple, but varying much in color; fruit capsule three-celled, three-valved, when ripe three-seeded, with obtuse angles and containing numerous flat seeds; rhizome horizontal with joints two to four inches long, cylindrical in lower half, upper part vertically flattened and an inch broad; surface annulated from leaf scars; rootlets from four to six inches long and crowded near the broad end of the joint; color of fresh rhizome yellowish-brown, and when dry gray-brown and internally gray or brownish; odor slight; taste acrid, nauseous. Solvent, alcohol. Dose, five to fifteen grains.

CONSTITUENTS—Acrid resinous matter, tannin, gum, starch.

PREPARATIONS—*Oleoresina Iridis*, *Oleoresin of Iris*. Dose, one to five grains. *Extractum Iridis Fluidum*, *Fluid Extract of Iris*. Dose, five to sixty minims. *Specific Iris*. Dose, one-fourth to five minims.

Physiological Action—*Iris Versicolor* has a bitter, nauseous, and rather acrid taste, and in full doses is apt to cause emesis. Recent experiments have demonstrated that preparations of the fresh root or the oleo-resin possess active, purgative and diuretic qualities, and under its influence there are increased secretion and elimination of bile, its cholagogue powers having been abundantly demonstrated. It also directly stimulates the entire glandular system—the lymphatics and the skin.

It promotes waste and elimination of effete material from the blood.

Specific Symptomatology—This agent will prove serviceable when the stools are clay-colored, the urine scanty and the skin inactive and jaundiced. In small doses it is indicated in irritable conditions of the mucous membranes of the digestive tract, with altered secretion. This condition is characterized by a neuralgic pain over one eye, or involving one side of the face, usually the right side; nausea or vomiting of an acid liquid, with burning and distress in the esophagus or stomach; gastralgia and gastrodynia, with vomiting or regurgitation of food, especially after the eating of fats or rich pastry; diarrhœa, with a burning sensation after the passage; cholera morbus, with violent pain around the umbilicus, or in the lower part of the abdomen, and watery diarrhœa with great depression.

Therapy—The oleo-resin has been very successfully employed in hepatic and intestinal disorders, and the consequent dropsy. Chronic jaundice, arising from duodenal catarrh and obstruction of the biliary ducts, should be treated with *Iris*. It is said that malarial jaundice (so-called) may be cured by this drug alone, and that it exerts a favorable influence in bilious remittent fevers and chronic ague. This agent is directly in-

licated in that condition of the stomach which induces **sick headache**. It not only ameliorates the attack, but assists in the removal of the cause and in breaking up the tendency to recurrence of the condition.

This agent is employed in the treatment of syphilitic and strumous affections. In the treatment of **syphilis** this agent is a very useful remedy in those cases in which the glandular organs are inactive. Here the effects of Iris are strikingly conspicuous from the first. It will be found an excellent auxiliary also to the influence of other well known alteratives. It has also been largely employed in the successful treatment of many affections of the skin.

In the treatment of certain cases of **eczema** of a persistent chronic character, as well as of other pustular and open ulcerating or oozing skin diseases, this agent, in from five to ten drop doses every two or three hours, will be found most useful. It may be diluted and applied externally also. Prurigo, crustacea and tinea yield readily to its influence at times.

It is a favorite remedy in the treatment of enlargement of the thyroid and other glandular affections. In recent cases of **goitre**, Iris is used to good advantage. With many, if used in the form of a recent preparation, it is believed to be specific.

CHIONANTHUS.

CHIONANTHUS VIRGINICA.

Synonym—Fringe Tree.

Part Employed—Bark of the root.

Natural Order—Oleaceæ.

Locality—Southeastern United States.

Botanical Description—*Chionanthus Virginica* is a shrub or low tree, eight to twenty-five feet high; leaves entire, opposite, deciduous, oval or obovate, three to five inches long, downy on the lower surface; loose panicles of flowers appearing in late spring or early summer; calyx very small, four-parted, persistent; corolla one inch long, four petals, acute, snow white; stamens two, short, on base of corolla; style short; stigma notched; fruit blue-purple drupes, fleshy, oval with a bloom, one-seeded; putamen bony; seed not albuminous; cotyledonous large and thick; bark of the root bitter. Solvents, alcohol, water. Dose, from thirty to sixty grains.

Constituents—Chionanthin, saponin.

Preparation—Specific *Chionanthus*. Dose, ten to twenty minims.

Action—Alterative, aperient, diuretic, tonic, febrifuge, purgative, cholagogue, acronarcotic.

Specific Symptomatology—The specific influence of this agent is exerted upon the liver. It is a remedy for engorge-

ment of the liver and **jaundice**. It is a cholagogue cathartic in full doses, but its best influence is in **acute congestion** of the **liver** with imperfect discharge of bile, or **catarrh** of the common **bile duct**. We have no agent more certain in its action when indicated. The indications are acute jaundice evidenced by yellowness of the conjunctiva first, subsequently of the skin, with distress in the right hypochondrium, with cramp-like pains in the abdomen.

Therapy—It overcomes catarrh, liquefies the bile, prevents the formation of calculi, and promotes the discharge of those formed. It is a remedy for chronic forms of liver disease, but its influence is not so plainly apparent, being much slower in its operations. It is not indicated in jaundice from permanent occlusion of the duct, from impacted gall stones or foreign and malignant growths.

It will quickly overcome the **jaundice** of **childhood** and infancy, and especially sure in the jaundice of the pregnant term. It is an excellent remedy for **malarial conditions** with atonicity of the stomach and intestinal apparatus. It can be given during the chill and fever, and it assists greatly in the relief of both. The agent may be pushed to the maximum dose and given with full confidence when indicated, as it is absolutely certain in its action. It is sometimes best given in infusion.

Co-Operatives—It works in harmony with podophyllum, leptandra, and especially with the sodium phosphate and iris versicolor.

CHELIDONIUM.

CHELIDONIUM MAJUS.

Synonyms—Great Celandine, Garden Celandine, Tetterwort.

Part Employed—The entire plant.

Natural Order—Papaveraceæ.

Locality—Europe.

Botanical Description—Chelidonium Majus is a perennial herb, indigenous to Europe, but naturalized in North America, growing in rocky, waste places and flowering from May to September. The stem is two feet high, light green, swelled at the joints, round, smooth; leaves smooth, deeply pinnatifid, four to eight inches long, petiolate, upper ones short, petiolate or sessile, light green above, hairy; flowers in four to eight-rayed axillary umbels on long hairy stalks, yellow; plant emits a yellow acrid juice when wounded; root several-headed, fusiform, three-fifths of an inch in diameter, somewhat scaly, reddish-brown color externally, whitish internally, deeply wrinkled; fruit capsule long, linear, one-celled and two-valved capsules:

seeds numerous, black, shining; odor unpleasant when fresh; taste acrid, and of the root intensely bitter. The herb should be gathered when beginning to flower. Solvents, alcohol, water.

CONSTITUENTS—A bitter principle, and the alkaloids chelidonine, sanguinarine, protopine and chelerythrine. It also contains chelidonic and chelidoninic acids and chlorophyll.

PREPARATIONS—Extractum Chelidonium, Extract of Chelidonium; Extractum Chelidonium fluidum, expressed juice of Chelidonium; succus Chelidonium. Dose, ten to twenty drops. Specific Chelidonium. Dose, from one-tenth to ten minims.

Physiological Action—Drastic cathartic, and violent local irritant, alterative, diuretic, diaphoretic, expectorant, vulnerary.

Specific Symptomatology—The conditions to which Chelidonium are especially applicable are found in fully developed abdominal plethora, inefficient functional action of the glandular organs of the abdominal cavity, and imperfect, sluggish and deficient circulation of the tissues, glands and organs of this cavity.

This agent operates in harmony with leptandra, podophyllum, iris versicolor, chionanthus and sodium phosphate, in the three following important conditions: Diminished secretion of bile, evidenced by grayish, clay-colored, or very light yellow stools, which will usually float. There may be no evidences of absorption of bile into the blood—no jaundice; or there may be absorption of the bile and jaundice, with its whole train of symptoms, with dark green and fetid stools and colic; or there may be the above grayish, clay-colored stools and jaundice, with bile in the urine, which is dark yellow or red, very acid, charged with an excess of uric acid crystals.

Therapy—**Sluggishness of the portal circulation.** Defective liver circulation, is the cause of a long train of remote manifestations, among which are slow pulse, frequent palpitations, a feeling of weight, stiffness and swellings of the hands, feet and limbs, cold extremities, pallid and doughy skin, local and general, œdema, dull pain or constant aching in the limbs and muscles, aching in the front head and occiput, vertigo, weariness, irritability, inactivity, irregularity of the bowels—constipation, followed by diarrhoea, erratic colicky pains, sallowness, jaundice and other disorders. Chelidonium is an excellent remedy in a case with these manifestations.

This agent was used thirty years ago with eminent success in the treatment of **biliary calculi**. It is now in use for that purpose among many physicians, who consider it superior to any other agent known in preventing their formation.

The specific use externally, is in the application of the juice to **warts, corns** and **epitheliomata**, for which it has been widely used, and much evidence accumulated in its favor. In these

conditions and in the treatment also of **urticaria**, **eczema** and itching eruptions, its careful application, persisted in, cures within a short time.

In the treatment of **cancer**, Denissenko directs that from twenty-two to seventy-five grains of the extract shall be taken internally, dissolved in distilled water or peppermint water, every day throughout the treatment. Into the substance of the tumor, as close as possible to the boundary between it and the healthy tissue, he throws a number of injections of from two to four drops of a mixture of equal weights of the extract, glycerine and distilled water, not exceeding a syringeful in all. If the tumor is ulcerated, he paints its surface twice a day with a mixture of one or two parts of the extract and one part of glycerine. The painting of the ulcerated surfaces gives rise to a slight and transitory burning. In all instances, after the injections, especially after the first one, there was a burning pain at the site of the operation, the patient felt weak, there was a more or less severe chill, and then the temperature rose to between 100 and 102 degrees. These symptoms disappeared on the following day.

As a result of the treatment the sallow hue of the skin disappeared and softening of the tumor set in. After from three to five days, there formed at the points of injection, fistulous tracts about which the softening process went on with special rapidity.

Other investigators have not been as satisfied with its influence in cancers, but it is doubtless of value and deserves further observation. Iron, quinine and other supporting remedies are employed according to the indications.

MERCURY.

Synonyms—Hydrargyrum, Quicksilver.

Description—Mercury is a liquid metal, of a brilliant silver white color, volatile at a comparatively low temperature, boiling at 680 degrees Fahr. and freezing at 40 degrees. It forms amalgams, as its alloys are called, with all metals except iron.

Occurrence—It has been well known for centuries and was frequently mentioned by ancient writers. It occurs free in considerable quantities, but is found most abundantly in combination with sulphur as a sulphide (cinnabar). It is found in this form in Spain, Austria and California. The ore is heated in proper vessels, and the volatile product is conducted through cool pipes or into a cool chamber where it condenses. Elemental mercury is of but little use in medicine.

It is used for extracting gold and silver from ores. Its amalgam with tin is the common coating for mirrors. It is

used in filling thermometers and barometers because of its susceptibility to changes of temperature, and the wide range between its freezing and boiling points.

Mercuric Chloride.

Synonyms—Hydrargyri Chloridum Corrosivum, Corrosive Mercuric Chloride, Corrosive Chloride of Mercury, Corrosive Sublimate, Bichloride of Mercury, Perchloride of Mercury.

Occurrence—Prepared by the sublimation and condensation of a mixture of manganese dioxide, mercuric sulphate and sodium chlorate.

Description—A crystalline body, colorless, odorless, with an acrid persistent metallic taste; soluble in sixteen parts of cold water, in two parts of boiling water, and in three parts of alcohol.

Dose, from the one-five-hundredth to the one-eighth of a grain.

Mercurous Chloride.

Synonyms—Hydrargyri Chloridum Mite, Mild Chloride of Mercury, Calomel.

Occurrence—This is obtained from subliming the product of a trituration of the mercuric sulphate, mercury and sodium chloride in boiling water.

Description—An impalpable white powder, odorless, tasteless, and permanent, insoluble in water and alcohol and entirely volatile. Dose, from the one-sixtieth of a grain to fifteen grains.

Mercuric Iodide.

Synonyms—Hydrargyri Iodidum Rubrum, Red Mercuric Iodide, Bin-Iodide of Mercury, Red Iodide of Mercury.

This salt precipitates from solutions of the corrosive mercuric chloride and potassium iodide. It is without odor or taste, permanent and comparatively insoluble in water; soluble in 130 parts of alcohol. Dose, from the one-one-hundredth to the one-eighth of a grain.

Mercuric Oxide.

Synonyms—Hydrargyri Oxidum Rubrum, Red Oxide of Mercury, Red Precipitate.

This substance results from dissolving mercury in dilute nitric acid, the product being triturated with mercury. Dose, from one-one-hundredth to one-tenth of a grain.

Mercurial Ointment.

Synonyms—Blue Ointment, Unguentum Hydrargyri.

Occurrence—This is formed of mercury, oleate of mercury, suet and lard rubbed thoroughly together.

Mercurous Salicylate.

Synonym—Salicylate of Mercury.

Dose, from the one-thirty-second to the one-eighth of a grain.

Mercury With Chalk.

Synonym—Hydrargyrum cum Creta.

Occurrence—This substance is prepared by triturating prepared chalk and mercury together, and adding clarified honey and water.

Description—It is a gray, moist powder, without odor and should be free from grittiness. Dose, from two to ten grains.

Mass of Mercury.

Synonyms—Massa Hydrargyri, Pilula Hydrargyri, Blue Mass, Blue Pill.

Occurrence—This is composed of mercury, powdered licorice, marshmallow and glycerine. Dose, from one-fourth of a grain to five grains.

Physiological Action—Notwithstanding the very general use of **Mercury** for nearly two centuries, its action is not yet clearly defined and its use is entirely empirical. It is classed as a universal stimulant, and has been used probably in every known disease. All authorities now admit that it has been a greatly over-used remedy.

Taken into the system in the milder forms it produces fetid breath, spongy gums and tender, "sore" teeth. The gums bleed readily and the flow of saliva is greatly increased, finally to an inordinate quantity. The inhalation of the vapor of mercury produces the above symptoms rapidly and in a marked manner. These are conspicuous in workers with the metal in the arts in which it is employed. It affects all the special senses in a marked and serious manner; the teeth loosen and drop out, the patient becomes feeble, debilitated, with general, physical and mental weakness; the corpuscular elements of the blood are destroyed, this fluid becoming greatly impoverished. The bones, especially the maxillaries, are subject to necrosis, and there is a general disintegration of tissue.

There are muscular trembling, paralysis agitans, chorea, and in some cases locomotor ataxia. The bichloride of mercury-corrosive sublimate, is violently poisonous and produces the most violent gastro-intestinal irritation, vomiting and purging of mucus and blood with the intestinal contents, collapse, with all of its phenomena and death.

In the consideration of mercury, and its compounds as therapeutic agents, the Eclectic school has in the past taken a unique position. The promiscuous, unscientific and excessive

use of the agent in the latter part of the last and the early part of the present century, for any and every condition, with the dire results that occurred from such indiscriminate use, caused our earlier investigators to assume a position at the opposite extreme, and to declare that its deleterious influences greatly overbalanced any possible good that could result from its use, and they decided to *exclude it entirely* from the list of medical agents, a course also adopted in the matter of venesection. With this complete ostracism, they at once set about seeking for vegetable and other remedies to take the place of these agents, and so well have they succeeded that many of our physicians, eminently successful in practice, have never given a dose of mercury in any form or never opened a vein.

We have so thoroughly replaced mercury in the treatment of syphilis, that we expect even in the "saturated" cases to remove every trace of the disease in a year, and in cases taken at the onset, we expect only mild manifestations if any at all. In the experience of fifty years, in the practice of nearly ten thousand active vigilant practitioners, these results are constantly confirmed, and ninety-five per cent of our physicians do not know from cases developed in their own practice, as the fully developed cases have been brought under their observation, what the developing characteristics of bad cases are. Our physicians know but little of the constitutional effects of mercury, and have had opportunities of treating mercurial conditions, only as the deeply seated cases have come to them for treatment, and not as the results of their own use of the agent. The advantages of our method of treatment are that the patient quickly regains his full vital tone, is not kept from business, and usually after three or four months treatment, he is with difficulty persuaded to continue the treatment, as he considers himself cured.

In its influence as a liver stimulant and as a cholagogue cathartic, mercury is now superseded to a great extent in all schools by agents more easily managed, and of more rapid and perfect elimination. For no condition is it given in excessive doses, and by far the larger part of the profession who use it, use it in minute or fractional doses.

The antiseptic properties of the bi-chloride of mercury are generally acknowledged, and this agent as a germ destroyer is in constant use in surgery.

In the treatment of intestinal disorders and as a liver remedy, mercury with us is almost entirely replaced by such agents as podophyllum, leptandra virginica, iris versicolor, chelidonium and sodium phosphate. In the treatment of syphilis our most potent remedy is echinacea. The other well known vegetable alteratives are used in various combinations with iodide of

potassium. Other specific conditions appearing during the course of the disease are promptly met with specific remedies.

Therapy—In a systematic consideration of the conditions under which mercury is now used in medicine, they are found to be capable of division into three classes: First, the use of the agent as a purgative and liver stimulant. Second, its use in the treatment of syphilis. Third, its use as an antiseptic and germicide. A fourth class has been considered, that of an antiphlogistic, but this influence is exercised by virtue of its antiseptic properties.

If the inflammation abates and the temperature falls after its use in typhoid fever and in diphtheria, it is because of the destruction of the bacillus in each case. This statement, however, is open to question in its application to all inflammatory conditions.

In the treatment of **inactivity** of the **liver**, and of the intestinal glands and intestinal obstructions, calomel has been long in use. In the past, calomel and blue mass were given in large doses for these conditions, but their use is now superseded by milder agents and is discouraged by almost the entire profession. Large doses of these agents were given, and then the bowel was cleared with large doses of salts or other alkaline purgatives. One of the most pernicious uses of these agents, which is still countenanced in certain localities, is their use in the forming stage of typhoid to produce violent evacuation of the bowels, the avowed object being to clear the canal of disease germs. The theory is fallacious in the extreme, and the results have been most serious in many cases which the writer has observed. In cases where so used the fever is apt to run from five to seven weeks. In such cases an absolutely non-irritating laxative only should be used which should be followed by a thorough colonic flushing by an antiseptic solution. The bichloride in dilute solution can be used to good advantage, but one of peroxide of hydrogen is preferable and devoid of danger. The internal use of the one-sixtieth of a grain of the corrosive chloride afterwards three or four times daily will keep up the effects, but the peroxide or a vegetable antiseptic, will as effectually preserve asepis with no danger.

In the treatment of **syphilis**, this agent or its salts are considered by the old school to be specific. It is a matter of surprise that so much confidence is placed in it, to the exclusion of all other measures, when every writer narrates so long a train of dire results occurring from even its careful use. The time advised for its continuance is from two to five years, and measures are usually suggested for the treatment of its untoward effects, and for the treatment of the extreme debility in which the patient is left. A method entirely devoid of untoward effects, and completely successful in six months, in the worst

cases in one year, that increases the vital tone of the patient from the first and leaves him in vigorous health, is much preferable and will ultimately receive general adoption.

In the treatment of syphilis blue mass and calomel are given internally; but the agent most popular, and used most persistently is probably the protiodide of mercury. The bichloride is advised in this disease hypodermically, in doses of one-twelfth to one-sixth of a grain.

Inunctions of mercury are made use of in all sanitariums and very generally in private practice. These are made of the oleate or the common ointment, and are applied in the axilla, or in the groins or over the abdomen.

Fumigations or inhalations of the vapor of calomel are also administered in the treatment of syphilis, a method that has been received with more or less general favor, but which must be used with caution.

Inhalations of the vapor of mercury are administered in the treatment of **membranous croup** and **diphtheria**, and if any internal use of the agent be considered rational, this method certainly could be so considered.

As **antiseptics** the bichloride and the bin-iodide of mercury are in common use. The argument of quickness of action and thoroughness is applicable to both, but the bichloride is in most common use. The strength of the solutions vary from one part in one thousand of water to one part in five thousand. Of the bin-iodide one part in four thousand to one part in twenty thousand of water is sufficient. The latter has the virtues of the former, and is less liable to produce poisonous effects because of the large quantity of water used.

The bichloride of mercury is less used as an antiseptic in surgical cases, than formerly.

It is considered a potent germicide in those cases in which it can be safely used. It will coagulate albumen and form with that substance inert compounds. The addition of a small quantity of a sodium chloride solution to the mercuric chloride solution will prevent such a decomposition. It is most commonly used upon the skin, to render it aseptic in preparation for surgical operation. It is used in the strength of one part to five hundred where a small surface only is to be dressed or where it is to be applied to the unbroken skin; where extensive use is to be made on open surfaces, from one part in five thousand, to one part in two thousand of water may be used. In some cases it will produce a characteristic mercurial dermatitis, some individuals being especially sensitive to its irritating influence. It is not used upon surgical instruments in any strength because of its corrosive action. It may be used as a gargle for the throat and mouth, and to wash putrid abscess cavities, as well as the vagina and bladder.

The bichloride in doses of from one-sixtieth to one-thirtieth of a grain every two hours has been used successfully in malignant **sore throat** and **diphtheria**. The patches are soon removed and the fever abates. We have so many other agents of equal efficiency that have no depressing influence upon the system that our practitioners seldom if ever use it for that purpose.

It is also used as an **intestinal antiseptic** in **typhoid** and other conditions of this character, as has been previously stated.

Triturated minutely with sugar of milk, the corrosive chloride is efficacious in **cholera infantum** with watery discharges and green stools. The one-five-hundredth of a grain is a sufficient dose. It is especially indicated where the choleric character is distinctly indicated. It is similar in its action to arsenite of copper.

SODIUM PHOSPHATE.

Formula— $\text{Na}_2 \text{H}(\text{PO}_4)$

Synonyms—Sodium Orthophosphate, Phosphate of Sodium.

Occurrence—In the process of the manufacture of this important salt, bones are burned to whiteness and finally powdered. This powder is mixed with sulphuric acid, water is added, and the whole stands for three days. Boiling water in large quantity is then poured on and the whole stirred. This after settling, is decanted and reduced by evaporation, and a solution of the carbonate of sodium is added to neutralization. The newly formed phosphoric acid then acts upon the sodium salt, replacing its own hydrogen by the sodium, the carbonic acid gas escaping in effervescence.

Description—The phosphate forms in large, colorless monoclinic prisms, which have a saline and cooling taste, are odorless, and effloresce in the air.

The salt is slowly soluble in water, but insoluble in alcohol. At a red heat it loses its water of crystallization and is converted into the sodium pyrophosphate, $\text{Na}_4\text{P}_2\text{O}_7$.

Dose, from ten to one hundred grains.

Physiological Action—If the sodium phosphate, in from one dram to one and one-half dram doses, be taken in cold water before breakfast, it produces a full, satisfactory and painless bowel movement, neutralizes excessive gastric acidity, and promotes a sense of well-being. Its regular use overcomes many cases of chronic constipation due to inactivity of the liver.

It improves the tone and greatly increases the functional activity of the liver, and stimulates the functional activity of the glandular organs concerned in digestion and food appropriation. It is an excellent eliminative if given in doses of one-half dram three or four times daily. There is no cathartic effect,

but its stimulant effects are maintained and an admirable general tonic influence induced. It is an actual brain and nerve food of rare value, a greatly underestimated remedy. To children it is given in doses of from three to ten grains in some convenient menstruum, the dose repeated every two hours. It may be given with the food of infants or dissolved in milk.

Specific Symptomatology—The Phosphate of Sodium in certain liver disorders of infancy is specific. The specific conditions are white pasty stools, often hard, sometimes spongy, so light in weight that they will sometimes float on water. This indication is present when there is a deficiency of the biliary secretion.

Therapy—The group of symptoms which this remedy will almost invariably cure are the following: **general inanition** and **malaise**, paleness of the mucous membranes, and almost complete **loss of appetite**.

The child cries if laid on its back, or whenever moved, because of **soreness** of the **muscles**, is dull, inclined to sleep most of the time, always irritable, or often restless during the night, not sleeping long at a time. The temperature is sometimes less than normal, but often there is a **variable temperature**, and sometimes there is a remittent fever with morning and evening exacerbations or an intermittent fever, and usually a slight rise in temperature.

In all cases there is a **deficiency** of the **red blood corpuscles**, and gradual, sometimes rapid, emaciation; there is an excess of phosphates in the urine, because the phosphates of the system, which should supply the nutrition of the osseous structures, are not performing that function, but are being excreted as a waste product.

The symptoms above described suggest very many remedies or combinations of remedies, but the author has often dispensed with every other remedy, however strongly suggested, and depended upon the Phosphate of Sodium alone, and has seen the patient improve from the first. These symptoms are the precursors of disease of the **bones**—**caries**, **necrosis**, **rachitis**, in fact the above description accurately describes the earlier symptoms of rickets, which may be often prevented by the early and persistent use of this remedy.

Co-Operatives—It acts in harmony with cholagogue cathartics, with podophyllum, leptandrin, chionanthus and iris versicolor. In the conditions in which these agents are suggested, this sodium salt is sometimes of unmistakable service.

CHAPTER III.

Agents Used as Mild Liver Stimulants.

TARAXACUM.
CEANOTHUS.

POLYMNIA.
JUGLANS CINEREA.

EUONYMUS.
SAPIUM SALICIFOLIUM.

TARAXACUM.

TARAXACUM OFFICINALE.

Synonym—Dandelion.

Part Employed—The root.

Natural Order—Compositæ.

Locality—Europe, North America.

Botanical Description—The Dandelion is an acaulescent perennial herb, a native of Greece, but now found growing in most parts of the world in pastures and fields, flowering from April to November; leaves eight inches long, two inches wide, radical, green, smooth, obovate-oblong, acute, runcinate, coarsely serrate, pinnatifid, numerous, spreading; flowers golden yellow, in round heads an inch and a half in diameter, terminal, on a hollow, erect, simple, smooth, naked, fragile scape; closing in the evening and opening again in the morning; calyx smooth, double, with the outer scales bent downwards; florets very numerous, ligulate, five-toothed; akene compressed, obovate-oblong, terminating in a silky, hairy, spreading pappus raised on a long stalk. At the period of maturity the seed down is disposed in a spherical form, and is so light and feathery as to be easily borne away by the wind, with the seeds attached. The root is six to twelve inches long, about half an inch thick, with several short, thick heads above and a few branches below; when dry, dark brown, internally white, with yellowish centre, longitudinally wrinkled, much shrunk, brittle, fracture short, showing pale yellow, porous wood surrounded by a dark-brown cambium line, and a thick white bark, containing many milk vessels in concentric circles; taste bitter. Solvents, dilute alcohol, boiling water. Dose, from one-half to two drams.

CONSTITUENTS—Taraxacin, taraxacerin, resin, inulin, pectin.

PREPARATIONS—Extractum Taraxaci, Extract of Taraxacum. Dose, from five to thirty grains.

Extractum Taraxaci Fluidum, Fluid Extract of Taraxacum. Dose, from one to four drams.

Specific Taraxacum. Dose, from five to sixty minims.

Physiological Action—This agent acts mildly upon the liver as a cholagogue, and in consequence its laxative influence is mild. It stimulates the flow of bile into the duodenum, and encourages the eliminative changes carried on by the liver. It encourages the proper elaboration and elimination of urea, and the excretion of uric acid. It is valuable in combination with

other remedies of similar action, in **chronic jaundice**, in conditions attributable to **auto-intoxication**, in **rheumatism** and in **blood disorders**, as an alterative. It is especially an alterative for **chronic eruptions**, and unhealthy conditions of the skin.

It will stimulate the stomach, and is useful in chronic **catarrhal gastritis** with perversion of nutrition. In **aphthous ulcerations** of the mouth it is useful.

CEANOTHUS.

CEANOTHUS AMERICANUS.

Synonyms—Red Root, New Jersey Tea.

Part Employed—The root.

Locality—North America.

Botanical Description—A small shrub indigenous to the United States, one foot long, an inch thick with a knotty head and several branches, brownish-red on incision with a wet like appearance, without odor, bitter and astringent.

PREPARATIONS—Extractum Ceanothi Fluidum, Fluid Extract of Ceanothus. Dose, from one-fourth to one dram.

Specific Ceanothus. Dose, from one-half minim to five minims every two to four hours.

Physiological Action—Astringent, stimulant tonic to mucous surfaces, and expectorant. It is to a certain extent mildly antiseptic. It is an alterative of much power in its influence over the portal circulation.

Specific Symptomatology—It has a specific influence upon the portal circle, influencing the circulation. In lymphatic patients, with sluggish circulation and inactivity of the liver of a chronic nature, with doughy-sallow skin, puffy and expressionless face, pain in the liver or spleen with hypertrophy of either or both organs, and constipation, it has a direct and satisfactory influence, especially if the conditions are of malarial origin.

Therapy—It overcomes indigestion and malassimilation under these circumstances, by its influence upon the portal circulation, and is thus a stomach remedy of much value.

It is not so direct a remedy in **acute inflammations** of the **liver** and **spleen**. When the above specific indications are present as a complication of any chronic condition, or with **syphilis** or **scrofula** or in general glandular disarrangements, the agent is indicated. Bronchitis, chronic pneumonitis and asthma are found present with the above general symptoms. Ovarian and uterine irregularities with such conditions will also be benefited by its use.

POLYMNIA.

POLYMNIA UVEDALIA.

Synonyms—Bearsfoot, leaf-cup, yellow leaf-cup.

Part Employed—The root.

Natural Order—Compositæ.

Location—In high woody sections of the United States.

Botanical Description—Polymnia Uvedalia is a coarse, plant found in moist, fertile soil along the eastern portion of the United States. It is pubescent, from four to ten feet high, with large leaves eighteen inches long and a foot broad, of deltoid-ovate shape, with three ribs, three to five lobes.

PREPARATIONS—Extractum Uvedaliæ Fluidum, Fluid Extract Uvedalia; not miscible with water. Dose, three to fifteen drops every three hours, gradually increased.

Specific Uvedalia. Dose, two to ten drops.

Specific Symptomatology—It is indicated in conditions of inactivity of the organs, with passive fullness of the circulation of the parts, or of surrounding tissues which may be of a sodden inelastic character. Inactive engorgements, or stagnations of the circulation, are general conditions pointing to the use of this agent.

Administration.—Two to five drops are given every three hours, and it may be externally applied in hot infusion, or in the form of an ointment made from the solid extract.

Therapy—The agent is specific when there is enlarged spleen, in the condition known as **ague cake**. It should be used freely internally, and externally the hot infusion must be applied. Other marked indications may be met with selected remedies.

It is indicated also in the **glandular** and structural **hypertrophy** of other organs. A chronically enlarged inactive engorged liver, with tenderness on pressure, is quickly and satisfactorily cured by it. A **womb enlarged** from **subinvolution**, or other hypertrophy, yields satisfactorily to its influence.

It has been used in **mastitis** or "caked breast" so-called, to excellent advantage, but its prolonged use may suppress the secretion of milk. It is an active stimulant to the removal of waste in all the conditions mentioned. The removal of chronic inflammatory deposits stimulates the capillary circulation to better action and relieves the aching pain and soreness common to such conditions.

It has been praised most highly in the treatment of **rheumatism, lumbago, myalgia**, and other painful conditions dependent upon the imperfect removal of the products of retrograde metamorphosis. It is a remedy of much value in **scrofulous conditions** with glandular indurations or abscess.

Its external application has relieved many cases of severe **spinal irritation**, especially if present with the general conditions named above as indicating the use of this agent. The solid ex-

tract is readily incorporated with any ointment base, and the external use of the agent over enlarged glands is often as important as its internal use.

Scudder claimed that it was the best **hair tonic** in the materia medica, in the proportions of four ounces of the tincture with twelve ounces of bay rum, to be rubbed thoroughly into the scalp. An excellent combination would be castor oil three parts, glycerine one part, lanolin three parts, extract uvedalia two parts, melted and rubbed together and cooled. This should be rubbed thoroughly into the roots of the hair. The addition of a very small quantity of cantharides improves this in stubborn cases.

JUGLANS

JUGLANS CINEREA.

Synonym—Butternut.

Part Employed—The inner bark of the root.

Natural Order—Juglandaceæ.

Locality—United States.

Botanical Description—A forest tree fifty feet in height, three or four feet in diameter; many horizontal branches, young branches smooth, leaves seven or eight, in pairs of sessile leaflets, two to three inches long, oblong-lanceolate, acuminate, serrate, downy; flowers, male and female on same tree; ovary surrounded with two large feathery rose-colored stamens; fruit single or several from same peduncle, nut hard, dark, rough; kernel oily, pleasant taste.

CONSTITUENTS—A resin, juglandin, a fixed oil, juglandic acid.

PREPARATIONS—Extractum Juglandis Fluidum, Fluid Extract of Juglans. Dose, from one minim to one-half dram.

Tinctura Juglandis, Tincture of Juglans. Dose, from five minims to one dram.

Specific Juglans. Dose, from one-third to one minim; prescribed from ten drops to one-half dram in four ounces of water, a teaspoonful every one, two or three hours.

Juglandin. Dose, from one-fifth of a grain to one grain.

Physiological Action—Experiments with the drug have ascertained that it influences, with great energy, the liver, small intestines, colon and rectum, causing an increased manufacture and elimination of bile, as well as increased activity of the glands of the intestinal tract. Full doses produce large bilious evacuations, without much pain or griping, in which respect its action very much resembles that of iris versicolor.

Therapy—It is a valuable remedy in **duodenal catarrh**, with torpidity of the liver and **chronic jaundice**. Small doses have been successfully employed in **dysentery**, **bilious diarrhœa**, and in intestinal diseases, with symptoms indicating irritability,

hyperæmia, or a tendency to inflammation. Chronic **constipation** can be successfully corrected by medium doses of the extract, if the affection depends upon defective elimination of bile, causing the stools to be clay-colored and dry from a lack of biliary and glandular secretion.

Combined with other agents, as hyoscyamus, belladonna, nuxvomica, leptandra or capsicum, a most excellent pill can be made, which will cure many cases of the above conditions, and will stimulate the stomach and intestinal tract, in those atonic or debilitated conditions which induce chronic dyspepsia. In the skin disorders named under dandelion, pustular and eczematous, it will act in the same manner as dandelion, and may be advantageously combined with that agent.

It is specifically adapted to **skin diseases** associated with some abnormal condition of the intestinal tract. **Eczema, herpes circinatus, acne, impetigo, pemphigus, rupia, prurigo moluscum, lichen** and chronic scaly skin diseases, yield to its influence with appropriate auxiliary measures. Irritation of mucous membranes, chronic inflammation of the throat, eruption over the body like that of scarlatina, *noli me tangere*, **scrofulous** enlargement of **glands**, congestion, and irritation of the respiratory and gastric mucous membranes, nursing sore mouth, ulcers in the mouth with constipation, rheumatism of the muscles in the lumbar region, yield to its influence.

Juglans cinerea has proved to be curative of a great variety of **skin diseases**, whether scaly or pustular, whether characterized by papules or bullæ, as stated above, so long as the lesion is associated with some **disorder of digestion** and assimilation.

It is analogous to arsenic in its action in squamous affections, and to sulphide of calcium in pustular diseases of the skin.

It may be used to advantage, both locally and internally, in chronic and ill-conditioned ulcers, stimulating waste and improving nutrition.

In the treatment of skin diseases with Juglans, a saturated tincture of the fresh inner bark should be employed in small doses, at the same time that the remedy is used as a local application. In obstinate cases of **chronic eczema**, the local use of the juice of the fresh inner bark has hastened the cure.

In bowel complaints of infants and children, in the constipation of nursing women, and in the commencing stages of diarrhoea and dysentery the syrup may be used, while the extract is the best form of the remedy as a cathartic in intermittent fever, and whenever the remedy is employed as a cathartic.

EUONYMUS.**EUONYMUS ATROPURPUREUS.****Synonym**—Wahoo.**Part Employed**—The bark of the root.**Natural Order**—Celastrineæ.**Locality**—United States.

Botanical Description—Wahoo is a shrub, six to fourteen feet high, of a strikingly handsome appearance in autumn when the fruit ripens; which, from its rich red color, gives the name of burning bush to the plant. It is tall; stem erect, branched; leaves oval, two to five inches in length, opposite, petiolate, serrate, pubescent beneath; flowers dark-purple, in loose cymes on axillary peduncles, petals and sepals in fours; capsule smooth, four-lobed.

The dried bark is in quilled or curved pieces, one-twelfth to one-fifth inch thick, outer surface ash-gray, with blackish patches, detached in thin and small scales; inner surface whitish or slightly tawny, smooth; fracture smooth, whitish; the inner layers of a laminated appearance; nearly inodorous; taste sweetish, somewhat bitter and acrid. (U. S.)

Solvents, alcohol, water. Dose, from one-half to one dram.

CONSTITUENTS — Euonymin, Atropurpurin, Asparagin, Euonic acid, resin, wax, fixed oil.

PREPARATIONS—Extractum Euonymi Siccum, dried Extract of Euonymus. Dose, from one to three grains.

Specific Euonymus. Dose, from five to thirty minims.

Extractum Euonymi Fluidum, Fluid Extract of Euonymus. Dose, from one to three drams.

Physiological Action—The agent is actively cathartic and alterative to an excellent extent, through its influence upon the function of the glandular organs. It exercises a distinct tonic influence.

Specific Symptomatology—Indigestion with biliousness, constipation, chronic intermittents with cachexia; pulmonary phthisis with night-sweats and great weakness; dropsical affections following acute disease; in convalescence from severe intermittent fever; enlargement of the liver; chronic bronchitis.

Therapy—Euonymus, or wahoo, is chiefly valuable as a tonic in **malarial cachexia**. It is antiperiodic, but much feebler than quinine. In those cases of indigestion and constipation with a yellowish tint of the conjunctiva, and round the mouth, the tongue being coated and of a similar color, indicating a cholagogue, euonymus is a good remedy.

In large doses, it is a drastic cathartic, causing emetocatharsis, and great prostration.

It is a general **nutritive tonic**, and may be employed where mandrake is beneficial, in torpid liver and bilious states, with weak digestion, constipation, and lithæmic neuralgia.

It acts as a **hepatic stimulant**, improving the protoplasmic function of the liver, and increasing the production of bile.

Its cholagogue power has been demonstrated by experiments on dogs, as well as when employed in the treatment of the human subject.

In **malarial disease**, after the fever has been broken, and in protracted convalescence, it is especially valuable as a tonic.

In chronic **pulmonary complaints**, it improves digestion, and gives tone to the respiratory organs, acting as an expectorant.

SAPIUM.

SAPIUM SALICIFOLIUM.

Synonym—*Yerba de la flecha*.

Part Employed—The root, bark and leaves.

Locality—Mexico, New Mexico and Arizona.

PREPARATIONS—Powdered Root. Dose, from one-half to one grain.

Fluid Extract. Dose, from one to five minims.

Infusion. Two ounces of the root to one pint of water. Dose, from twenty to thirty minims.

Botanical Description—*Sapium Salicifolium* is an indigenous perennial plant, by the aborigines vulgarly called *yerba de la flecha*, which means poison arrow, and used by them as a purgative. It grows wild in abundance in Mexico and Arizona. It is a shrub, like hazel and grows similar to hazel, ten to twelve feet high. The leaves resemble the well-known senna in shape but not in size. The odor of the infusion is slightly faint, with an agreeable bitter taste. Water and diluted alcohol extract its active principle from the root and bark as well as from the leaves, and produce a fine fluid extract.

Physiological Action—In large doses it is poisonous, produces dysentery, vertigo and death from prostration and nervous exhaustion.

Sapium Salicifolium is an energetic cathartic and diuretic, produces copious liquid discharges without griping. In minute doses at intervals of four hours it stimulates the torpid liver up to its normal action, also increases the flow of urine and exerts a direct influence on the kidneys and urinary passages.

Therapy—In **bilious colic** caused by presence of calculous matter, *Sapium Salicifolium* combined with mono-bromated camphor promptly dislodges the gravel, calms the nervous system and quiets the distressed stomach.

The principal advantage the drug has over other cathartics and diuretics is its superior efficacy, its pleasing taste, besides its antilithic properties; the agent is not widely known. The small and pleasant dose and kindly action will give it a place as an efficient cathartic, if the above statements are confirmed.

CHAPTER IV.

Agents Used as Hydragogue Cathartics.

ELATERIUM.

CROTON OIL.

JALAP.

HELLEBORE.
MAGNESIUM SULPHATE.

ELATERIUM.

ECBALLIUM ELATERIUM.

Synonym—Squirting Cucumber.**Part Employed**—A sediment from the juice of the fruit.**Natural Order**—Cucurbitaceæ.**Locality**—South Europe.

Botanical Description—Ecballium Elaterium is a perennial plant; stem trailing, succulent, bristly, two to four feet long; leaves cordate, petiolate, three to five inches long, lobed, bristly, pale-green; flowers monœcious; corolla yellow, deeply four-lobed, veined; fruit two inches long, one inch thick, oblong, pale-green, prickly, three-celled, containing bitter watery, mucilaginous juice in which are many light-brown seeds. When the fruit is ripe, it falls to the ground and the watery contents and seeds are violently expelled through the peduncle orifice; hence the name squirting cucumber.

In preparing Elaterium the fruit is collected just before it ripens, cut open, and the contents gently squeezed out, and this juice set aside to settle, the sediment being dried on porous tiles. On account of the uncertain strength of Elaterium, **elaterin**, a crystalline substance of definite strength, is prepared from Elaterium. Dose, one-sixteenth grain.

CONSTITUENTS—Elaterin, prophetin, ecballin, hydroelatin, elaterid, chlorophyll.

PREPARATIONS—Trituratæ Elaterii, Trituration of Elaterin. Dose, grain one-half.

Specific Elaterium. Dose, one-third to fifteen minims.

The specific medicine is one of the most energetic of all ordinary preparations. It precipitates upon addition to water, and to avoid a concentrated dose, a mixture must be thoroughly shaken each time before administration. It has a characteristic clear green color.

Physiological Action—Hydragogue cathartic, diuretic. Large doses may kill by causing inflammation of the stomach and bowels.

Therapy—**Dropsies** of a general character are relieved at once by Elaterium. It produces such hydragogue action as to at once unload the cellular tissues, of serum. It produces such gastrointestinal irritation, however, in excessive doses, that caution must always be exercised in its administration. If violent vomiting is produced, its influence upon the dropsy is not marked. It exercises a powerful derivative influence and is a

depleting agent of marked potency. It is in almost universal use in the treatment of dropsy among old school physicians.

In the treatment of **cystitis**, Elaterium in small doses is used with excellent results by many physicians.

Both King and Scudder recommended it in chronic and acute cystitis and in nephritis, especially in inflammation of the neck of the bladder. They produced its hydragogue action for its derivative influence first, by half drachm doses of the tincture until its full influence was obtained, subsequently they gave smaller doses. Recent authorities claim cures of a satisfactory character by the use of from ten to twenty drops of the specific remedy in four ounces of water, a teaspoonful every two or three hours. It is deserving of extended trial.

JALAP.

IPOMCEA JALAPA.

Part Employed—The tuberous root.

Natural Order—Convolvulaceæ.

Locality—Mexico.

Botanical Description—Jalap is a twining, herbaceous, perennial herb, with a tuberous root, growing in the eastern part of Mexico, and flowering from September to November; stem twisted, smooth, purplish, furrowed, slender, rising on neighboring objects about which it twines to a height of twelve to twenty feet; leaves entire, cordate, deeply incised at the base, acuminate, smooth, exstipulate, prominently veined beneath; long petioled; flowers lilac-purple; limb two to three inches wide, salver-shaped; corolla funnel-form, two inches long, standing on a long peduncle, which supports two or three flowers; stamens five; anthers white, exserted; ovary two-celled; stigma simple, capitate; capsule two-celled, two-seeded; root roundish or pear-shaped, one to four inches thick, heavy, compact, hard, brittle, with a shining, undulated fracture, with numerous resinous points, externally brown, wrinkled; internally grayish, with numerous concentric circles; odor heavy, sweetish; taste acrid, nauseous. Solvents, dilute alcohol. Dose, from five to thirty grains.

CONSTITUENTS—Convolvulin, jalapin, gum, albumen, salts.

PREPARATION—Extractum Jalapæ, Extract of Jalap. Dose, from five to fifteen grains.

Pulvis Jalapæ Compositus, U. S. P. Dose, from ten to thirty grains.

Pulvis Jalapæ Compositus, A. D., Compound Powder of Jalap, Beach's Antibilious Physic. Dose, one dram.

Therapy—Jalap is an active cathartic. With the older physicians it was commonly used, but the modern school apparently does not often find a need for it. It produces large alvine

or watery evacuations with griping, and extreme nausea in some cases. Hypercatharsis and continued colic are induced by it. It influences the small intestines most directly. In cases of chronic inactivity of the intestinal tract, with persistent constipation and inactivity of the glandular organs, it will increase their action; will cleanse the entire tract and stimulate normal action. It is an old remedy for dropsy. It is superseded by other and more satisfactory agents.

HELLEBORUS.**HELLEBORUS NIGER.**

Synonym—Black Hellebore.

Part Employed—The rhizome and rootlets.

Natural Order—Ranunculaceæ.

Locality—Europe.

Botanical Description—Black Hellebore is a perennial evergreen plant, called Christmas rose because flowering in warmer parts of England in winter. It has palmately-lobed leaves, which stand on long foot-stalks springing immediately from the root. Each leaf is composed of seven to nine leaflets, which are ovatelanceolate, smooth, coriaceous and serrated above. The flower stem also rises from the root and supports a single large rose-like flower, which has five large pinkish sepals and ten greenish petals. Stamens numerous, anthers yellow, capsule leathery; seed black, shining, umbilicated, arranged in two rows; rhizome black on the outside, white within, two inches long, one-half inch thick, knotted; rootlets long, about the size of straws, very brittle; taste sweet, then bitter. Solvent, water, alcohol. Dose, five to twenty grains.

CONSTITUENTS—Helleborin, helleborein, gum, resin, fat.

PREPARATIONS—Vinum Hellebori Compositum, Compound Wine of Hellebore. Dose, one-half ounce to two ounces.

Specific Hellebore. Dose, one-tenth to three minims.

Physiological Action—Black Hellebore, when locally applied, causes irritation of mucous membranes and of the conjunctiva, inducing redness, swelling and increased secretion. A moderate dose taken internally produces no effect, but a considerable quantity causes loss of appetite, nausea, vomiting, pain and inflammation of the stomach and bowels. Medicinal doses strengthen the heart and increase the force of the pulse; while toxic doses cause paralysis with rapid pulse and sudden arrest of the heart. The effect on the nervous system is partial paralysis with tremors, followed by violent convulsions.

Physiological Action—The agent is a drastic hydragogue, cathartic in its fresh active form. It is emetic also and emmenagogue. In over-doses it readily produces hyper-catharsis and hyper-emesis. It is a constituent of proprietary pills, but

- is not widely used in general medicine. In small doses it acts as a stimulant to the liver and to the secretory glands of the gastro-intestinal tract.

Therapy—In **hysteria, melancholy, mania** and other mental conditions in which the **abdominal organs** are seriously at fault, it is prescribed with benefit.

The agent is prescribed in dropsical conditions where there is great inactivity on the part of the liver, with torpidity of bowels, with general anasarca or pericarditis or hydrothorax. It is not always the best remedy even in these conditions.

The agent is a local anæsthetic, especially to the conjunctiva. Helleborein, a crystalline glucoside, in solution dropped into the eye, will produce anæsthesia of the structures through the cornea while the sensibility of the contiguous structures is not impaired. It is not in general use for this purpose.

CROTON OIL.

TIGLII OLEUM.

Part Employed—A fixed oil expressed from the seeds of the croton tiglium.

Natural Order—Euphorbiacæ.

Botanical Description—The tree from the seeds of which the oil is obtained, is from fifteen to twenty feet high, with a crooked trunk and a smooth, light-brown bark; leaves alternate, serrulate, petiolate, acutely ovate, bright green, four or five inches long and two inches broad; flowers monœcious in terminal racemes, uni-sexual; fruit encapsuled, three-fourths of an inch long, three cells, each containing one seed, which is smooth, grayish-brown or mottled, flat on the ventral surface.

The oil is obtained by compression, from the seeds. It is of a pale-yellow or light-brown color, with a sp. gr. of 0.95, viscid, fluorescent, with a mild fatty odor, but with an acrid, pungent, burning taste. It has a slight acid reaction, reddening litmus; soluble in sixty parts of alcohol, freely so in chloroform, ether, and in fixed and volatile oils, and in carbon disulphide.

CONSTITUENTS—Glucosides of tiglinic, formic, isobutyric and other acids. The vesicating principle is soluble in alcohol, while the purgative principle is insoluble.

Administration—The dose of the oil is from one to two minims, best administered in emulsion or pill form. It is not to be administered if there is gastric or intestinal irritation or inflammation, or if there is great weakness or prostration.

A single drop is usually a sufficient dose. This may be administered disguised in anything the patient can be made to take. Dropped on the tongue it acts quickly. Two drops will produce violent action in most cases.

Physiological Action—This is a drastic hydragogue cathartic. It is exceedingly irritating and produces a profound revulsive or derivative effect.

Therapy—In **apoplexy** or in sudden **paralysis** from cerebral hyperæmia, or from rupture of the cerebral vessels, a profound derivative influence may be at once obtained from an active dose of croton oil. In acute **cerebritis**, or in **meningitis**, or in violent delirium, or furious mania in adults, it is sometimes beneficial. Its use in accordance with present methods of treatment is very limited, many physicians finding no place for it at all.

Its external use produces active counter-irritation. This pronounced influence was once thought a necessary measure in **pneumonitis** and **pleuritis**, and it was freely used in inflammatory rheumatism, and in sciatica and other **persistent neuralgias**. It was used in cerebral and cerebro-spinal meningitis, and in cases of excitable delirium and acute mania.

Its influence is too irritating and prostrating for dropsical cases which are usually enfeebled from disease.

MAGNESIUM SULPHATE.

Formula— $\text{MgSO}_4 \cdot \text{H}_2\text{O}$.

Synonyms—Epsom Salt, Sulphate of Magnesium.

Occurrence—Magnesium sulphate occurs in nature in seawater, in so-called mineral springs and as an efflorescence upon the rocks, and in the crevices in many caves in the United States, and in other localities. It may be obtained by acting upon sulphuric acid, with the magnesium carbonate.

Description—It occurs in small, colorless prisms or needle-shaped crystals, having a bitter and somewhat acrid and saline taste. It is freely efflorescent in the air, soluble in water and insoluble in alcohol. It resembles both oxalic acid and sulphate of zinc in its crystalline form, and has been mistaken for these substances with serious results. Although considered a mild agent, death has resulted from large, concentrated doses.

Administration—For general administration it is better to give this agent in a hot solution. Usually one-half of the otherwise necessary dose will accomplish the same result if hot. It is stated that if an ounce be boiled for a short time in a pint of water to which a grain or two of tannic acid is added, it will be entirely deprived of its bitterness. In solution in hot milk, it is of value in debilitated patients. The dose as a hydragogue is from half an ounce to an ounce, well diluted. As an aperient and antacid, from ten to thirty grains will prove satisfactory.

Therapy—This agent is demanded when a non-irritating **cathartic** is needed, which will produce copious watery stools

without nausea or pain. It is of much service in abdominal surgery, thoroughly evacuating the intestinal canal prior to an operation. Given in small doses it stimulates normal secretion, causes liquid feces and prevents any possible impaction. This is accomplished without stimulating the peristalsis to any great extent, or otherwise disturbing the muscular structure of the bowels.

It is a most available remedy in **dropsy**. If the skin is cool, it eliminates large quantities of water through the kidneys as well as from the intestinal canal.

If the character of the kidney disease is such that active elimination is undesirable, it will cause active transpiration through the skin instead, if the skin be thoroughly warm and moist at the time of its administration.

If the patient is greatly debilitated, it will not produce increased weakness, if it is given in conjunction with the carbonate of iron or some other mild, well selected tonic. If given when the stomach is empty, it seems to act more directly upon the kidneys, as a diuretic.

In the treatment of **dysentery**, given in small doses, it is an efficient remedy. It apparently has a soothing instead of an irritating effect, as have most cathartics in this disease.

It is valuable in **impaction** of the bowels from any cause. In this case fifteen grains of the salt with an equal amount of the bitartrate of potassium every two hours will produce satisfactory results. This combination is also useful as an antacid and refrigerant in many of the disordered conditions of the stomach and bowels during hot weather.

If the agent be administered in full doses in **colica pictonum** it will serve an excellent purpose. Inasmuch as sulphuric acid is a direct antidote in **lead poisoning**, the dilute acid may be added in small quantities to a solution of this remedy.

CHAPTER V.

Agents Used in the Neutralization of Acids, and for Their Characteristic Influence Upon the Gastro-Intestinal Tract.

SODIUM CARBONATE.	LIQUOR POTASSÆ.
SODIUM BI-CARBONATE.	POTASSIUM CARBONATE.
SODIUM SULPHATE.	POTASSIUM BI-CARBONATE.
SODIUM SULPHITE.	POTASSIUM CITRATE.
SODIUM CHLORIDE.	LIQUOR CALCIS.
CAUSTIC POTASSA.	MAGNESIUM OXIDE.
MAGNESIUM CARBONATE.	

The Comparative Action of Sodium and Potassium Salts.

The physician, in his study of the compounds of sodium and potassium, finds himself considering the action of the substance with which these elements are combined, rather than the influence of the element itself. All the elements entering into the construction of a chemical compound, influence the therapeutic action of that compound to a greater or less extent, although the influence for which the compound is usually prescribed, is that of the most active element in the compound.

Of the two elements, sodium is much milder in its influence upon the system than potassium, and yet the compounds of the latter have long been most commonly used. Potassium in large doses is an irritant poison, and its salts produce effects by virtue of this action, which may be avoided by using the same compounds of sodium, which, although an irritant, is not so to any extent comparable with potassium.

The influence of potassium in its compounds is to suspend the functional operations of the muscular and nervous structures. This is plainly apparent in its action upon muscular contractility, notably that of the heart, the action of which is retarded and its power of contractility reduced by the potassium salts to an extent from ten to fifteen times greater than by the sodium salts. When in combination with bromine, this property would, in many cases, increase the action of the bromine, and thus prove desirable, as when administered for an excitable condition of the heart, in sthenic conditions, or in oversexual excitement, or in conditions where there is excitability of the circulation, local or general, with hyperæmia, with greatly increased muscular and arterial tension.

The influence of potassium upon the mucous membranes and glandular structures of the stomach and intestinal canal is more irritating, and interferes with the functional action of these structures to a much greater extent than sodium. The sodium salt is appropriated much more readily and is more kindly received, and can be given with a satisfactory influence upon the

stomach when disorders of that organ complicate the general condition.

This fact is confirmed by the common use of the sodium compounds instead of those of potassium in gastric acidity, and in general disorders of the stomach and intestinal canal.

It will be observed that where the general functions of the organs of the gastro-intestinal tract are impaired the sodium compounds, for whatever purpose prescribed, will exercise a more desirable influence, but in conditions where these organs are intact, and there is exalted heart action and an exaggerated arterial tonus, the potassium compounds may be preferable.

The more soothing influence of the sodium compounds upon the mucous structures facilitates their absorption, and this perceptibly promotes their action. It is often observed that the same results are obtained from the use of five or six grain doses of the sodium bromide or iodide, as are accomplished by no less than ten grains of similar potassium compounds, because of the more ready appropriation of the sodium compounds. The lack of irritable properties facilitates their elimination also.

SODIUM CARBONATE.

Formula— $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$.

Synonyms—Sal soda, washing soda.

Occurrence—This salt occurs native in many parts of the world. It occurs as an efflorescence on the soil throughout the western portion of the United States. Artificially prepared, common salt is converted into the sodium sulphate by sulphuric acid. The sodium sulphate is decomposed by the carbonate of lime and charcoal at a high temperature; the product is sodium carbonate.

Description—It is a crystalline body, odorless and colorless, with an unpleasant, pungent, alkaline taste. It is reduced by efflorescence in dry air to a white powder.

It is freely soluble in water, but insoluble in alcohol and ether. Its **physiological properties** are similar to those of the other salts of sodium and potassium. Its general influence is considered under the consideration of alkaline agents.

It is the analogue of potassium carbonate, as efficient and even milder in its action than that salt, in specific application.

SODIUM BICARBONATE.

Formula— NaHCO_3 .

Synonym—Acid Sodium Carbonate.

Occurrence—This common salt of sodium, differs from the sodium carbonate only by the replacement of one atom of sodium by hydrogen. It may be prepared either by saturating

the carbonate of sodium with carbonic acid or by inducing a reaction between the chloride of sodium and the bicarbonate of ammonium. It is also prepared in breweries by placing the carbonate of sodium over fermenting beer vats so that the carbonate is constantly immersed in an atmosphere of carbonic acid gas. In this form it is sold as *soda saleratus*.

Description—It is an opaque, white, odorless powder, with a cooling alkaline taste. It is slowly decomposed in moist air, but is permanent in dry air; soluble in twelve parts of water; it decomposes with loss of its carbon dioxide in hot water, giving a slight alkaline reaction to litmus paper. It is actively effervescent on the addition of mineral acids.

Physiological Action—This agent increases the alkalinity of the blood. It is readily diffusible and rapidly neutralizes excess of acidity. It increases the alkalinity of the urine during the presence of the salt in the system, but usually after its withdrawal the acidity is considerably increased. This increase of acidity is apparent when the agent is administered continuously in the treatment of gastric hyperacidity. Its free administration is apt to be injurious to the stomach.

Therapy—It is beneficial if given after meals in **hyperacidity** due to fermentation. In cases of **deficient secretion** of the gastric juice it should be given half of an hour before meals.

Dr. Sternberg treated thirty cases of **yellow fever** by the use of this salt alone, with recovery in every case. In all cases of severe **diarrhœa** with excessive acid reaction it will produce good results.

It is an old remedy in the treatment of **inflammation** of the **bladder**. Woodbury advised ten grains in half an ounce of an infusion of *uva-ursi*, given every two hours. He claimed immediate results in acute cystic inflammation. In such a case, however, it will be important to consider the reaction of the urine and administer the agent before or after meals as indicated by the reaction.

Externally the agent seems to possess antiseptic properties. Because of the presence of carbon, with its alkaline reaction the agent is applicable to **burns**; applied in the form of a moist paste it will relieve the pain at once in most cases. It may be removed after a few hours and proper dressing applied.

It is considered a beneficial remedy in the treatment of **eczema**, many authorities advising its use. A strong solution applied to a surface **poisoned** by **rhus toxicodendron** will usually give quick relief.

In the treatment of some forms of **indolent ulcer** its persistent application will relieve pain, reduce swelling, and check the formation of pus.

In a general way the agent is advantageous in the treatment of **leucorrhœa**, especially if the discharge has an acid reaction. It is freely used in solution as a douche.

It is also useful as an irrigating fluid in cases of **cystitis** where there is a strong acid reaction with a deposit of urates and uric acid.

SODIUM SULPHATE.

Formula— $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$.

Synonym—Glauber's salt.

Occurrence—This salt is found in many locations in nature, and it occurs as a by-product in the manufacture of chlorine gas and hydrochloric acid, from the decomposition of sodium chloride and sulphuric acid.

Description—It occurs in the form of large, transparent prisms, or transparent, colorless, granular crystals, without odor, and with a bitter, saline taste. It is actively efflorescent, very soluble in water and glycerine, but insoluble in alcohol.

Physiological Action—It has long been in use as an active, hydragogue cathartic. In small doses it is laxative, aperient and diuretic. When the powder is given, one-half the usual dose only is needed, as it has lost one-half its weight in the loss of its water of crystallization.

Its action is in every way similar to that of the magnesium sulphate, which is preferable because of its superior palatability and more kindly action. It was at one time advised as a specific remedy for **opacity** of the cornea. The dry, powdered crystals were applied directly to the eyeball, once or twice daily. This salt was popular with the fathers of our school in the compound known as **white liquid physic**. This preparation was made by dissolving half of a pound of the sodium sulphate in one and one-half pints of water; to this, an ounce each of nitric and hydrochloric acids was added. Of this, a tablespoonful was given every hour until free evacuation occurred.

Although very efficacious in many conditions, this compound would blast the reputation of the modern physician, by its disagreeable taste.

Therapy—Sodium sulphate is given in **hepatic congestion** with suppression of the bile. It is a good agent in **chronic jaundice** and in catarrh of the bile ducts where there is constipation with clay-colored feces.

It is valuable in **biliary** and **renal calculi**. It has a modifying influence upon the urine and is beneficial in **catarrh** of the **bladder**, where the urine is of a strongly acid reaction.

SODIUM SULPHITE.

Formula— $\text{Na}_2\text{SO}_3 \cdot 7\text{H}_2\text{O}$.

Occurrence—This salt is prepared by passing sulphurous acid gas to complete saturation into a solution of sodium carbonate. The product is evaporated and crystalized.

Description—It occurs in the form of monoclinic prisms, transparent, colorless and odorless. It has a saline, slightly acid and unpleasant taste suggesting sulphur. It effloresces in the air, and by absorption of oxygen is increased to the sulphate. When heated it softens and absorbs oxygen more rapidly. The aqueous solution is feebly alkaline. The dioxide of sulphur may be liberated upon the addition of hydrochloric acid.

The salt is soluble in four parts of cold water, freely soluble in hot water and slightly soluble in alcohol. It should be kept in well stopped bottles in a cool place. The powdered salt is preferable for general administration.

Administration—The dose of the salt is from two to twenty grains. Ten grains in solution is about the maximum for usual prescription. It may be given every two or three hours. The principal objection to its use is its unpleasant taste, which is difficult to conceal.

Specific Symptomatology—Scudder laid great stress upon the use of this remedy when there is pallor of the tissues of the tongue, which is broad and coated with a dirty fur, or with a whitish or yellowish thick, moist coat.

This agent prevents fermentation in the gastro-intestinal canal. It is specific for vomiting of frothy or yeasty matter. The microscopic fungi *torula cerevisiæ* and *sarcina ventriculi* are present in this vomited matter. Under these circumstances, the cause being removed, nervous excitement abates, the pulse and temperature are reduced, digestion and appropriation are encouraged. The condition may be present in all acute, eruptive or inflammatory fevers. It should not be depended upon to fulfill other than the conditions named. The other evidences should be met in each case with the proper indicated remedy.

Therapy—When the indications for the use of the remedy are present with general indisposition, without the presence of any recognized disease, this agent alone may be all that is necessary for a cure.

In aphthous conditions of the mouth, or of other mucous surfaces due to parasitic causes, this agent acts with extreme rapidity.

A solution of this salt is sometimes applied to foul smelling ulcers, to phlegmonous abscess where vegetation is apt to be present, or where gangrene is threatened.

In the treatment of small-pox, erysipelas, and in some cases

of typhus and typhoid fevers with all the indications present, this agent performs a very important service.

SODIUM HYPOSULPHITE.

Formula— $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$.

Synonym—Sodium thiosulphate.

Occurrence—It may be prepared by mixing dry sodium carbonate, finely powdered, and sulphur, and heating the mixture. The product, the sodium sulphite, is boiled with sulphur. The hyposulphite deposits in crystalline form.

Description—The crystals are colorless, transparent and odorless. They have a cooling and bitter taste. The salt is efflorescent in dry, warm air. It is freely soluble in water, slightly soluble in oil of turpentine, insoluble in alcohol.

Physiological Action—In physiological action, this agent has all the properties of the sulphite, intensified. It is specifically opposed to fermentation. It is exceedingly popular among veterinarians because of its influence over this process, which is a common source of disease in horses and cattle. The fermentation of large masses of food in the stomach of these animals is the common cause for **flatulent colic**. It is indicated also in diseases which result from fermentation or zymosis in the blood. It decreases the uric acid and sulphates and causes the appearance of oxalic acid in the urine.

Therapy—It is active in its influence upon parasitic skin, or ulcerations of the skin or mucous membrane due to this cause, such as **sycosis**, **impetigo**, **scabies** and **favus**. It is specific in **yeasty vomiting**, and will serve an excellent purpose in the treatment of parasitic disease of the mouth and of the skin.

Solutions of this salt may be atomized or vaporized and inhaled in fetid **bronchitis**, in **pulmonary inflammation** with purulent discharge, and more especially in **gangrene** of the **lungs**.

The dose of this salt is from two to fifteen grains, repeated often if necessary.

SODIUM CHLORIDE.

Formula— NaCl .

Synonyms—Common table salt, Sea Salt, Muriate of Soda.

Occurrence—This substance occurs in nature in extensive quantities. It is the largest constituent of the solids of sea water.

Description—It crystalizes in the form of cubes—cubical crystals of a white, colorless, transparent character, or as a

white crystalline powder, permanent in the air, soluble in two and eight-tenths parts of cold water and in two and one-half parts of boiling water. Very slightly soluble in alcohol. Insoluble in ether and chloroform.

Physiological Action—Salt is an essential constituent in the animal economy. It is in the strictest sense of the word atrophic. It is more than a tonic because a food.

Therapeutically in large doses it is emetic and cathartic. It is refrigerant, and in small doses antiseptic, astringent and anthelmintic.

Therapy—In **narcotic poisoning** it is dissolved in warm water and produces immediate emesis. It is a chemical antidote to the nitrate of silver. Doses of ten or fifteen grains in solution five or six times a day will cure some cases of **obstinate constipation**.

It has been used with good effect in **intermittent fever** given in the intermission in doses of half an ounce to an ounce. In hemoptysis, half of a teaspoonful taken dry will frequently stop the hemorrhage.

In its external use, it has a wider field. Hot solutions of salt persisted in are of unfailing benefit in **local inflammation** of the lungs, liver, spleen, pleura or peritoneum, and especially of the **kidneys**. It is most serviceable in inflammation of the **joints**, either traumatic, rheumatic or tubercular in character. In inflammation of the **throat** or tonsils, either malignant or benign, a saturated compress kept hot is valuable. The solution may be used as a gargle, and is sometimes of greater value if a small quantity of vinegar is added. It is useful in the inflammation of the **brain** and **spinal cord**, and in **glandular inflammations**.

In some cases of granular **ophthalmia**, dilute solutions applied are of service. It is a popular domestic remedy in the treatment of **catarrh**, acute and chronic. It is an essential constituent of nearly all advertised catarrh cures.

A few grains dissolved in hot water, drawn into the nostrils from the palm of the hand, or applied with a douche, will benefit atrophic rhinitis. One pound of salt dissolved in about four gallons of water produces a salt bath of about the same consistency of sea water.

Physiological Salt Solution.

Physiological Action—A solution of sodium chloride, which represents in relative strength the fluids of the body, and which is known as the physiological salt, solution, is made by adding one part of salt to 130 parts of water. It is extemporaneously approximated by adding one drachm of salt to one pint of sterilized water.

Therapy—It is indicated where **sudden shock** suddenly sus-

pendes the function of the medulla oblongata, and the heart's action, or where there is **acute anæmia** from sudden loss of a large quantity of blood, either from primary or secondary hemorrhage, or in **violent diarrhœas** where the circulation is suddenly deprived of a large proportion of its fluid constituent, as in **epidemic cholera**. It was first thought to be beneficial only when injected slowly into a large vein. This is the most direct method of introduction, and should be resorted to when death seems imminent. If there seem to be a few moments to spare, it may be carefully injected into the cellular tissue beneath the skin, anywhere in the body, usually in the abdomen, slowly injecting ounce after ounce, until six or eight ounces every two hours are injected, changing the point of injection and carefully rubbing the swelling produced by its introduction. In some cases, it will do much good by its introduction into the rectum in larger quantity, if it is held, by a compress over the anus. Its temperature should range from 98 to 104 deg. according to the method of introduction adopted, and the condition of the patient.

POTASSIUM HYDRATE.

Formula.— KHO .

Synonym.—Caustic Potash.

Occurrence.—This is prepared by boiling down a solution of potash until it is of the consistency of a heavy oil, when it is poured into molds and hardens in the form of sticks or pencils.

Physiological Action.—This is an organic caustic of the greatest activity. It is applied directly to the part to be destroyed, being held with a pair of forceps. The surrounding parts should be protected with oil or a paraffine coating. It produces pain and local inflammation. Any excess should be removed with a dilute acid or vinegar.

Therapy.—It is used in the removal of vegetations, small foreign growths, ulcers, phagedena, gangrenous sores, and in chancres and chancroids.

LIQUOR POTASSÆ.

A solution of potassium hydrate in water. It contains five per cent of the salt.

Description.—A heavy colorless and odorless liquid, with a strongly caustic and acid taste, and a positive alkaline reaction. If administered internally, the dose is from one to ten minims, freely diluted.

Therapy.—It is caustic—irritating and acrid in its influence

upon mucous surfaces or upon the skin. It is replaced for internal use to a superior advantage, by the salts of potassium or by aqua calcis. It is serviceable as a clinical reagent.

POTASSIUM CARBONATE.

Formula— K_2CO_3 .

Occurrence—This salt is usually obtained from the ash of the residue of beet sugar manufacture. If commercial pearlash is treated with distilled water and evaporated, this salt is precipitated.

Description—It occurs in the form of a granular powder, white, odorless, and with a pungent, alkaline taste. It is deliquescent and freely soluble in water. It is insoluble in alcohol. It should be kept in well stoppered bottles. It is sometimes called the **salt of tartar**.

Therapy—Its uses are the same as those of potassium bi-carbonate, but it is more harsh and irritating in its action. It neutralizes excess of acid in the stomach, prevents the excessive formation of **uric acid**, is an active **diuretic**, stimulates the action of the **liver** by exciting the function of that organ, and produces watery discharges.

It is sometimes combined in neutralizing mixtures, but is usually replaced by the bi-carbonate.

It corrects **heartburn**, **pyrosis**, **morning sickness of pregnancy**, when due to acidity, and **acid dyspepsia**.

The agent is an antilithic of some value. It is an old time remedy for **gout**, and corrects the free deposit of crystallized uric acid in the urine. It was long called a remedy for **gravel**, but the uric acid gravel, not the gravel of alkaline urine, is corrected by it. It is not apt to produce flatulence. It is given in rheumatism only when the excessive acid conditions named are present.

It is a valuable agent for extemporaneous administration to children, for the correction of all forms of indigestion and stomach derangement depending upon hyperacidity, as it does not liberate gas, and thus induce flatulence.

It is given in doses of from ten to thirty grains in water when its neutralizing or antacid influence only is desired. When a laxative effect is sought, from one to two drams are necessary. When it is used as an antidote to acid poisoning, a teaspoonful every five or ten minutes is needed, until the acid is believed to be neutralized.

Five or ten grain doses are sufficient for children.

The **magnesia ponderosa** U. S. P. is in every way similar to this in character, but is more condensed in bulk.

POTASSIUM BICARBONATE.

Formula— KHCO_3 .

Synonyms—Kali Bicarbonicum, Acid Carbonate of Potassium.

Occurrence—In the production of this salt, a solution of pure potassium carbonate is thoroughly saturated with carbonic acid, and the saturated solution is evaporated, or it may be obtained from the complete saturation, by carbonic acid gas, of a solution of caustic potassa in eighty per cent alcohol, or by carefully acting upon a solution of the carbonate with acetic acid.

Description—The salt occurs in the form of transparent, prismatic crystals, colorless and odorless, with a slightly pungent and alkaline taste. It is permanent in the air, soluble in three parts of cold and two parts of hot water at a temperature of 122 degrees Fahr. At a temperature above this point, the carbonic acid gas is driven off, reducing the salt to the carbonate of potassium. It is nearly insoluble in alcohol.

Physiological Action—The presence of an organic acid in this class of compounds in union with the basic radical renders them direct in appropriation and efficient in action. This agent is similar in manner of action to the carbonate, but it is more acceptable to the stomach, and of mild taste. It is not as agreeable as the sodium bicarbonate, which will replace it in all particulars. It prevents the formation of an excess of uric acid and opposes lithæmia.

Therapy—It is given in **rheumatism** and **gout**, and in all conditions where there is chronic acidity of the stomach. The salt is given in doses of from five to sixty grains in solution. Smaller doses persisted in are better than occasional large ones.

POTASSIUM CITRATE.

Formula— $\text{K}_3\text{C}_6\text{H}_5\text{O}_9\text{H}_2\text{O}$.

Synonym—Citrate of Potassium.

Occurrence—It is made by the action of citric acid upon the carbonate of potassium in solution, and this solution is then evaporated to dryness.

Description—The salt forms as a granular powder, or it may occur in the form of transparent crystals. In either case, it is odorless, and has a cooling, salty taste, and is deliquescent in the air. It is freely soluble in water, sparingly so in alcohol.

Therapy—It is a cooling diaphoretic, and has long been used in the treatment of **fevers**. If it is dissolved in an excess of lemon juice, its virtues are enhanced. Such a solution is of value in **rheumatism**, in rheumatic fevers, and in all **lithæmic conditions**.

POTASSIUM BI-TARTRATE.

Formula— $\text{KHC}_4\text{H}_4\text{O}_6$.

Synonyms—Bi-tartrate of Potassium, Cream of Tartar, Acid Tartrate of Potassium.

Occurrence—This salt is formed from the crude substance precipitated during the process of fermentation of grape juice, and is called **crude tartar** or **argol**. The acid tartrate is a natural constituent of grape juice, being retained in solution by the grape sugar. When the sugar is decomposed by the fermentation, the alcohol so formed causes the salt to be deposited.

Description—It occurs in the form of aggregated crystals, or white crystalline crusts, usually described as colorless or slightly opaque, or a white gritty powder without odor, and of a pleasantly sour taste. It is permanent in the air, dissolves in 207 parts of cold water and in seventeen parts of boiling water, and is slightly soluble in alcohol. The crude cream of tartar of commerce, contains an adulteration of calcium tartrate.

Therapy—This agent is a very mild laxative, and must be given in sufficient doses to produce its effect. It produces watery discharges, and in adequate doses acts as a stimulating diuretic. In small doses, it is a cooling aperient.

It is an irritant to the gastro-intestinal apparatus if its use be persisted in. Because of its hydragogue effect, this agent is in common use in reducing **dropsical effusions**. It is especially useful when the urine has an ammoniacal odor, is alkaline in reaction, and deposits a thick heavy sediment. An infusion of juniper or digitalis will sometimes enhance its effects in dropsy. If a teaspoonful of this salt be added to half a pint of water, to which the juice of half a lemon be added, the whole well-sweetened with white sugar, a cooling, palatable drink is prepared, which is of much service in **fevers**.

Combined with equal parts of sulphur, and given in teaspoonful doses, the agent was once commonly used in **constipation**, where the intestinal secretion was deficient. It is beneficial in **hemorrhoids** under the same circumstances.

POTASSIUM AND SODIUM TARTRATE.

Formula— $\text{KNaC}_4\text{H}_4\text{O}_6 \cdot 4\text{H}_2\text{O}$.

Synonym—Rochelle salt.

Occurrence—Obtained by the interaction of the carbonate of sodium and the acid tartrate of potassium. It occurs in the form of colorless, transparent crystals which effloresce in dry air, or it may occur as a white powder. In either case, it is odorless, and has a cooling, slightly acrid, saline taste, is freely soluble in water and nearly insoluble in alcohol.

Therapy—This agent is a mild purgative, and is especially useful in that class of cases, in which an alkaline salt is needed to relax the bowels where irritation exists and violent action must be avoided.

It is not unpleasant to the taste, and is most kindly in its action. In small doses, it neutralizes excessive **acidity** of the **urine**. Combined with the bi-carbonate of soda and tartaric acid in fine powder, it forms the well known **Seidlitz powder**. The sodium bicarbonate and this salt are mixed intimately and wrapped in blue papers, the tartaric acid in white papers. These are dissolved separately in cold water and then mixed, and the solution is drunk during effervescence.

Half an ounce of the potassium and sodium tartrate is necessary to produce purgative action, operating more quickly if dissolved in hot water.

LIQUOR CALCIS.

Synonyms—Aqua Calcis, solution of Calcium Hydrate, Lime Water.

Occurrence—Unslacked lime in excess is dissolved in pure water until complete saturation occurs. The first saturation is discarded, as it will probably contain impurities, and then the remaining lime is again treated with water, and this solution is retained for use.

Description—It forms a clear, odorless, colorless, somewhat heavy liquid, with an acrid, slightly caustic taste. Exposed to the air, it becomes faintly milky from the absorption of carbonic acid, and ultimately deposits a white precipitate of calcium carbonate, or a pellicle of the carbonate forms upon the surface, if the liquid be not disturbed.

Therapy—This solution is a common neutralizing agent, antacid, slightly astringent, commonly given in acid **dyspepsia**, and in acid conditions attended with **diarrhoea**. It is a domestic agent in the treatment of infantile disorders. It is the common belief that all stomach disorders are due to excess of acid, and the agent is often given without discrimination. In cases where milk coagulates in hard curds, it will neutralize the excess of acid and retard the coagulation.

The remedy is said to be of value as a spray in **diphtheria** and **croup**, but we have so many more efficient remedies that it is not used. The vapor of lime water is inhaled to excellent advantage in cases of membranous croup by throwing large pieces of lime into an open vessel, containing hot water, and confining the steam with the patient under a cover.

A soapy mixture of lime water and linseed oil, known as **carron oil**, is the old treatment for burns and scalds. Lime water internally for crops of **boils** was once in common use.

MAGNESIUM OXIDE.**Formula**— MgO .**Synonyms**—Magnesia, Calcined Magnesia, Light Magnesia, Magnesia usta.**Occurrence**—This substance is prepared by heating the magnesium carbonate at a slow red heat in a loosely covered crucible.**Description**—It occurs in the form of an amorphous white powder, very light and bulky, odorless, with a slight alkaline taste. It is practically insoluble in water, requiring 5,142 parts for its solution, insoluble in alcohol.

If the powder effervesces upon the addition of dilute acids the carbonates are presents as an adulteration.

Therapy—This substance is a mild laxative. It is antacid to a practicable degree and in no way objectionable, if it is not permitted to accumulate in the intestinal canal. It is indicated in **sick headaches**, when the tongue is thick and uniformly covered with a white coating, and the mucous membranes are pale. There are sour eructations and nausea, **constipation**, general lassitude and indisposition and recurring headache, in acute attacks the headache persisting for days.

In such a condition, antacids of any character—the sodium, potassium, calcium, or magnesium salts are positively indicated, but the calcined magnesia is, perhaps, most commonly used.

The agent exerts but little effect if there is no excess of acid. In its relaxing influence, it acts slowly, and if excessive acid is present, the bowel movements are watery, and, usually, more or less feculent. The agent is given in all diseases complicated with derangement of the stomach from **hyperacidity**, as the progress of a disease is always encouraged and recovery greatly delayed, by a seriously deranged condition of the stomach and assimilative organs. The alkaline reaction of this substance renders it valuable in neutralizing the concentrated acids when poisoning has occurred from them. It should be used in every case, if possible, instead of the carbonate, as the latter substance gives off its carbonic acid gas during the process of neutralization so freely that in some cases, where the disintegration of the coats of the stomach has been sufficiently great, rupture or perforation of these has occurred from distension.

It is useful in arsenic poisoning, but it is not as reliable as the iron sesquioxide.

If the administration of this agent be persisted in when no excess of the acid is present in the stomach or bowels, it will neutralize the normal acid, and accumulate within the canal, acid drinks being sometimes necessary for its removal.

MAGNESIUM CARBONATE.

Formula— Mg. CO_3 .

Occurrence—The carbonate of magnesia occurs in nature as a native mineral known as magnesite. In its manufactured form it occurs as the heavy carbonate—**Magnesii Carbonas Ponderosa** and the light carbonate—**Magnesii Carbonas Levis**. The latter is the common form. It is prepared by mixing a solution of magnesium sulphate and sodium carbonate, and evaporating the mixed solution to dryness.

Description—It occurs in commerce in the form of cubes of an amorphous powder, compressed, light of weight, white and friable. In its crystalline form it occurs in minute crystals. It is odorless, and of an earthy taste.

It is not altered in the air, is very slightly soluble in water, 2,493 parts being required for its solution, insoluble in alcohol. It is decomposed by heat and by acids, and alkaline oxides.

Administration—As an **antacid** from ten to twenty grains is the dose, and if repeated at intervals of once an hour it acts as a physic and purgative. If first rubbed up thoroughly with a little syrup or glycerine, it can be easily combined with water for administration, otherwise it does not readily mix in water.

In regard to its action the statements made concerning calcined magnesia, are in nearly every case applicable to this agent. It is a pleasant remedy, agreeable and efficacious in its administration in all acid conditions. It is actively antacid, laxative in **acid diarrhoeas**, but inert and accumulative in alkaline conditions.

Therapy—It is applicable where the calcined magnesia is indicated. The objection to its use, which renders calcined magnesia preferable, is that it must of necessity liberate its carbonic acid gas in the stomach or intestinal canal, and thus produce flatulence, and, in some cases, temporarily painful distension, an especially objectionable feature in children. In **sick headaches** and in **persistent nausea** and **vomiting** from extreme acidity, in adults, however, this is sometimes a desirable feature, the gas acting as a stimulant and the distension arousing the muscular action of the stomach.

EFFERVESCENT MAGNESIUM CITRATE.

This popular salt is prepared by first intimately mixing magnesium carbonate and citric acid with a few minims of water, to form a thick paste. This is dried at a low temperature and finely powdered. This powder is then intimately mixed with

sodium bicarbonate, more powdered citric acid, and a little sugar. The whole is dampened with a little alcohol and rubbed through a coarse sieve and dried. It is kept dry in well closed vessels. It is in the form of a coarse, granular powder, white, deliquescent in the air with liberation of the carbonic acid, very soluble in water with active effervescence. The solution is active in its reactions. From one-half to two drams is the dose, stirred into a glass of water and drunk while effervescing.

The salt is given in doses of from one half to three teaspoonfuls in sufficient water.

Solution Magnesium Citrate.

In the manufacture of the solution of the citrate—**Liquor Magnesii Citratis**, the constituents, except sodium bicarbonate, are mixed in a strong bottle with the syrup of citric acid. The bottle is nearly filled with water, and when ready to seal, sodium bicarbonate is added, and the bottle securely closed. The action of this solution, and the salt in solution is the same.

Therapy—This preparation is probably the most pleasant of this class of cathartics. It is a palatable solution, and is acceptable to almost any condition of the stomach. It produces a free watery movement from the bowels without pain if given as a purgative. In smaller doses, the bowels may be kept in a soluble or mildly relaxed condition. It is an antacid and refrigerant. The solution is dispensed in strong twelve-ounce bottles, the entire quantity being necessary to produce thorough evacuation. As a laxative, the contents of one bottle may be given in two, three or four doses.

CHAPTER VI.

Agents Acting as Direct Intestinal Astringents.

EPILOBIUM.

RUBUS VILLOSUS.

COTO.

CATECHU.

KINO.

EPILOBIUM.

EPILOBIUM ANGUSTIFOLIUM.

Synonym—Wickup, Willow herb.

Part Employed—The leaves.

Natural Order—Onagraceæ.

Locality—Europe, United States.

Botanical Description—A perennial herb, growing from four to six feet high, with leaves resembling those of the willow—three to five inches long, lanceolate, entire, pale green beneath, smooth; purple colored, showy flowers; root fleshy, yellowish white, with thick bark; taste astringent mucilaginous.

PREPARATIONS—Extractum Epilobii Fluidum. Fluid Ex-

tract of *Epilobium*. Dose, from five to sixty minims. Specific *Epilobium*. Dose, from ten to sixty minims.

Administration—The usual method of administering the remedy is to add one ounce of the herb to a pint of boiling water, and, when cold, to give it in teaspoonful doses every fifteen, thirty, or sixty minutes, according to the severity of the case. Where the fresh herb cannot be obtained, a tincture made from the fresh herb may be substituted for it.

Physiological Action—The several species of *epilobium* are astringent, tonic, emollient, and demulcent, and have a specific influence on the intestinal mucous membrane. The *epilobium palustre* has a well established reputation as a remedy in intractable cases of camp dysentery and diarrhœa; cases having been cured by it when other means had failed.

Specific Symptomatology—**Chronic diarrhœa** with general emaciation, and a persistent enfeebled condition with dry, dingy, rough, harsh skin. If no great structural change, and no tubercular or cancerous conditions are present, this agent is the most satisfactory remedy we have. It is suggested where the abdomen is contracted, and where the diarrhœa is feculent in character with sharp colicky pains.

Therapy—It will be curative also in general relaxed, subacute or acute cases of **diarrhœa**, after the stage of inflammation has passed, but is not as reliable a remedy at that time as *geranium*.

In **mucœ-enteritis**, it is of some service in conjunction with the indicated remedies. It is very useful in the diarrhœa of typhoid fever; it acts kindly and surely. The author seldom uses any other astringent when these conditions are present. It exercises an apparent tonic influence upon the mucous and glandular structures of the entire intestinal canal, overcoming ulceration, and being of material benefit in the more speedy restoration of normal function.

RUBUS.

RUBUS VILLOSUS.

Synonym—Blackberry.

Part Employed—Bark of the root.

Natural Order—Rosaceæ.

Locality—North America.

Botanical Description—*Rubus Villosus* is a perennial, shrubby plant, one to six feet high; stem pubescent, prickly, angular, reddish, erect or reclining, armed with stout recurved prickles; leaves in threes, sometimes fives, or solitary, on channeled hairy petioles; leaflets ovate, serrate, hairy on both sides, two to four inches long; foot-stalk and midrib armed with short prickles; flowers white, in erect racemes, with a hairy, prickly stalk; fruit black when ripe, consisting of about twenty round-

ish, shining, fleshy carpels, closely collected into an ovate head, sub-acid, well flavored. This species furnishes our cultivated blackberries. The root is woody, knotty, horizontal, cylindrical, from the size of a straw to nearly an inch in diameter; bark thin, brownish, and occurs in thin, tough, flexible bands, outer surface blackish, inner surface pale brownish, inodorous, astringent, bitter. Solvent, water, alcohol. Dose, from half a dram to two drams.

Rubus Canadensis, or dewberry, possesses the same medicinal properties as the blackberry.

CONSTITUENTS—Villosin, tannin, gallic acid.

PREPARATIONS—*Extractum Rubi Fluidum*, Fluid Extract of *Rubus*. Dose, from ten to sixty minims.

Specific *Rubus*. Dose, from five to thirty minims.

Specific Symptomatology—The tonic and astringent properties of this remedy are underestimated. It is an acceptable and prompt astringent in **diarrhœas** of infancy, where the evidences of relaxation and enfeeblement of the mucous coats of the stomach and bowels are marked, and where there is deficient action of all glandular organs, especially of the liver, the patient being pale, feeble, without appetite.

Therapy—In those cases of diarrhœa where there are large, watery, clay-colored discharges three or four times each day, an infusion of blackberry root will sometimes correct this entire train of symptoms. A syrup of blackberry will also answer an excellent purpose.

COTO BARK.

Description—The botanical source of coto bark is not certainly known, but it is supposed to be obtained from a species of nectandra, a plant or tree growing in Bolivia.

The coto bark of commerce is in flat or curved pieces about a foot long, three or four inches wide, half an inch thick, of a cinnamon-brown color; both surfaces irregular with numerous projecting bark-bundles; on cross-section, the bark shows yellow dots of groups of stone-cells and bast fibers, fracture, short, granular, except the inner layer which is coarsely splintery; odor aromatic; taste bitter, aromatic, pungent. Solvent, alcohol. Dose, from five to twenty grains.

CONSTITUENTS—A volatile alkaloid, volatile oil, resin, starch, gum, sugar, calcium oxalate, tannin, formic, butyric and acetic acids, cotoin, para-cotoin, oxyleucotin, leucolin, hydrocotin, dilbenzoylhydrocotin, peperonylic acid.

PREPARATIONS—*Fluid Extract of Coto Bark*. Dose, from five to twenty minims.

Specific Symptomatology—Epidemic diarrhœa, attacks occurring at night suddenly, or in early morning, stools frequent,

ten to twenty in a few hours; colliquative, rice-water stools, nausea and vomiting with great distress, sharp, cutting pain in the bowels, involuntary evacuations, extreme prostration, surface bathed in cold clammy perspiration, collapse, febrile reaction.

Therapy—It is carminative, stimulant and astringent. It has a specific effect on the alimentary canal but is not a suitable remedy where inflammation exists or is threatened, but rather should be employed in relaxed states, and where some poisonous element has been taken into the system in the food or drinking water. It is antiseptic or promotes asepsis.

It acts favorably in the **diarrhœa** of **typhoid fever**, in colliquative diarrhœa from whatever cause, in the diarrhœa of consumptives and in atonic and catarrhal diarrhœa.

It possesses astringent properties and contracts the relaxed vessels. It is one of our most efficient remedies in the exhaustive sweats of consumptive patients. It may be given in tendor doses of the fluid extract, repeated according to the urgency of the case.

The best results have been obtained from rather large doses, and it is a good rule where relief does not follow the prescribed dose to increase it.

CATECHU.

ACACIA CATECHU.

Synonym—Terra Japonica.

Part Employed—Extract prepared from the wood.

Natural Order—Leguminosæ.

Locality—East Indies, Hindostan.

Botanical Description—Acacia Catechu is a tree thirty to forty feet high; trunk one foot in diameter, crooked, branchy toward the top; branches having a pair of strong, hooked stipulate spines at the base of each leaf stalk; bark rust-colored, thick, rough; leaves bipinnate, five to eight inches long; pinnae in ten to twenty pairs; leaflets thirty to fifty pairs; linear, hairy, one-fourth inch long; flowers pale yellow, in dense, cylindrical spikes four or five inches long, axillary; fruit lanceolate, brown pad, compressed, smooth, margin undulated, containing six to eight flattened, roundish, brown, shining, veined, coriaceous seeds; bark slightly bitter and extremely astringent. Solvents, water, alcohol.

The extract of catechu is prepared by boiling the chips in water and evaporating the decoction after it has become sufficiently strong, until the extract is of sufficient consistency to be poured into moulds or spread upon mats.

It is exported from Pegu and Calcutta packed in mats, and appears as irregular masses, dark brown, brittle, porous, glossy

fragments; fracture conchoidal, with fragments of leaves and matting. Dose, from five to twenty grains.

CONSTITUENTS—Catechu, tannic acid, catechin, quercetin. Catechu-red, gum.

PREPARATIONS—Tinctura Catechu Composita. Compound Tincture of Catechu. Dose, from ten to forty minims.

Therapy—A tonic astringent indicated in **diarrhœas** where the discharges are serous, very watery in character—large fluid discharges, with much mucus. It will relieve **intestinal hemorrhage**, when the above diarrhœas are present, and the mucous membranes are relaxed, and out of tone. If combined with stimulant tonics or aromatics, it is more serviceable. With special uterine tonics, it will be found advantageous in **menorrhagia**.

KINO.

PTEROCARPUS MARSUPIUM.

Part Employed—The juice dried without artificial heat.

Natural Order—Leguminosæ.

Locality—India, Ceylon.

Botanical Description—The *Pterocarpus Marsupium* of the East Indies is a tree sixty to eighty feet high, two to three feet thick, with many spreading branches; bark brownish-gray, inside red; leaves unequally pinnate, deciduous; five to seven leaflets, two to four inches long, alternate, emarginate, coriaceous, elliptic, firm, deep-green and shining above, less so below; flowers pale-yellow, in loose racemes; fruit an indehiscent pad, orbicular; seed single, reniform.

East India Kino is in small pieces, pulverulent, angular, deep ruby-red color, or dark-brownish, glistening and brittle, inodorous, and of a rough astringent taste, tinging the saliva blood-red, and adhering to the teeth. Solvents, alcohol, water. Dose, from ten to twenty grains.

CONSTITUENTS — Pyrocatechin, kino-tannic acid, kino-red, kinoin.

PREPARATIONS—Tinctura Kino, Tincture of Kino. Dose, from ten to sixty minims.

Physiological Action—This agent produces a slight hardening and mild discoloration of the unbroken skin. Its astringent influence upon mucous membranes is more pronounced. Upon raw surfaces it contracts tissues, checks the flow of blood, coagulates albuminoids, and in some cases produces local irritation. It is positive and immediate in its action upon the mucous structures of the gastro-intestinal tract, acting as a persistent tonic astringent. It is almost entirely devoid of irritating properties.

Therapy—Kino is less used than formerly. It may be given whenever there is excessive secretion or excretion. In

inordinate night sweats, either during convalescence from prostrating disease, or those of phthisis pulmonalis, it is a useful remedy. It has been given in **polyuria** and in **diabetes mellitus**, also in protracted **watery diarrhœas** without pain, characterized by relaxation and flabbiness of tissues, and general feebleness. It may be prescribed in the **diarrhœa** of **typhoid**, also, with good results, especially if hemorrhage be present.

The powder may be blown into the nostrils in **epistaxis**, and it may be dusted on ulcers and bleeding surfaces. An injection of a strong solution is useful in **leucorrhœa** and in other discharges, either of a specific or non-specific character. It is of some service in **pharyngitis** or in **elongated uvula**, also in simple acute sore throats.

CHAPTER VII.

Agents Acting as Gastro-Intestinal Astringents with Marked Tonic and Stimulant Properties.

GERANIUM.

QUERCUS.

CAJUPUT.

PINUS CANADENSIS.

GERANIUM.**GERANIUM MACULATUM.**

Synonym—Cranesbill.

Part Employed—The rhizome.

Natural Order—Geraniaceæ.

Locality—United States.

Botanical Description—A round, erect, annual stem from one to two feet high, gray or grayish-green in color, dichotomously branched; leaves in three, five or seven lobes, hairy, incised at the extremities, pale-green mottled, lower petiolate, upper sessile, linear stipules; flowers large, from one to one and one-half inches wide, purplish, umbels, five petals entire, bearded on claw, flowers from April to July; fruit five carpels, each with one seed; rhizome perennial, horizontal, cylindrical, two to three inches long, with short rootlets; it should always be collected in autumn.

CONSTITUENTS—Tannic acid, gallic acid, red coloring matter, a resinoid.

PREPARATIONS—Extractum Geranii Fluidum, Fluid Extract of Geranium. Dose, from ten to sixty minims.

Specific Geranium. Dose, from one to ten minims.

Physiological Action—A tonic astringent, with alterative properties. It influences the mucous structures, directly improving their tone and function, overcoming relaxation and debility with a marked improvement of the capillary circulation.

The author esteems geranium more highly than any other vegetable astringent, where a simple tonic astringent action is needed. It is palatable, prompt, efficient, and invariable in its effects, and entirely devoid of unpleasant influences.

Specific Symptomatology—Where there are relaxed, atonic or enfeebled mucous membranes, *in the absence of inflammatory action*; debilitated conditions remaining after inflammation has subsided; excessive discharges of mucus, serum or blood with these conditions, this agent is indicated.

Therapy—In **sub-acute diarrhœa** geranium exercises an immediate influence, a single full dose producing a marked impression and improving the tone of the entire gastro-intestinal tract from the first. In **chronic diarrhœa**, no matter how stubborn, it may be given with confidence if the specific conditions are present. In doses of ten drops every two hours, diarrhœas of the above described character will promptly subside. Active inflammation must be subdued before the agent will act readily. It is the remedy for the general relaxation of the gastro-intestinal tract in childhood, with protracted diarrhœa. Any extreme activity, or hyper-activity of the liver, must be corrected, and this agent will usually do the rest. In **catarrhal gastritis**, where there is profuse secretion, with a tendency to ulceration, with, perhaps, a mild hemorrhage, this agent is very useful.

It has been claimed that **incipient gastric cancer** has been cured with geranium, and there is no doubt that it takes precedence over many other remedies, when a diagnosis between severe gastric ulcer and incipient cancer cannot be made without exploratory operation. Its range seems much wider than that of a simple astringent, as it controls pain and rapidly improves the general condition. Half of a dram may be given every three hours, but smaller doses may do as well.

It has an influence over **passive hemorrhage** unlike that of other agents, but in violent cases of recent origin it is not the best remedy. The author treated a case of **hematuria** for nearly two years with absolutely no permanent impression upon the condition. Tubercular bacilli were found in abundance in the blood, which was usually arterial in character and steady in quantity. All of the usual remedies were used. Finally fifteen drops of geranium were given every two hours, and in two weeks the blood was absent, and had not returned at the end of eight months, and the patient improved slowly in general health.

Others of our writers refer to its use in **phthisis pulmonalis**. They claim that all the symptoms are retarded by its use, and that it improves the general tone and overcomes the **night sweats**. It may have a subtle influence upon tubercular bacilli or the conditions induced by them, not understood, which would account for its phenomenal action in the conditions referred to.

QUERCUS.

Synonym—White Oak.

Part Employed—The bark.

Natural Order—Cupulifera.

Locality—United States, Canada.

Botanical Description—The white oak is a forest tree from sixty to ninety feet high, three to six feet in diameter, covered with a whitish bark; leaves divided into from three to five obtuse, oblong, entire lobes, bright-green above, glaucous beneath; flowers monœcious; pistillate ones in small, single groups, staminate ones in slender, naked catkins; fruit a one-seeded nut, acorn, inclosed at the base by an indurated, scaly cup.

There are several species of oak, *quercus rubra* or red oak, *quercus tinctora* or black oak, and *quercus alba*, being those chiefly used in medicine, the latter being most commonly employed.

The outer, scaly portion of the bark, which possesses no medicinal virtues, should be removed. The inner portion, the white oak bark of commerce, is in nearly flat pieces, one-fifth of an inch thick, pale-brown with pale-grayish spots on the outer surface, and longitudinal ridges on the inner surface; fracture tough, fibrous; odor faint; taste strongly astringent, bitterish. Dose, half a dram.

CONSTITUENTS—Tannin, quercin.

PREPARATIONS—*Extractum Quercus Albæ Fluidum*, Fluid Extract of *Quercus Alba*. Dose, from a half to one dram.

Specific Quercus. Dose, from five to thirty minims.

Therapy—The agent is of value in epidemic dysentery, acute and chronic diarrhœa, obstinate intermittents, pulmonary and laryngeal phthisis, *tabes mesenterica*, great exhaustion of the vital powers from disease, profuse, exhausting night sweats, colliquative sweats in the advanced stages of adynamic fevers, and debility, and severe diarrhœa in sickly children, scrofula, gangrene, ulcerated sore throat, fetid, ill-conditioned and gangrenous ulcers, relaxed mucous membranes with profuse discharges, **bronchorrhœa**, **passive hemorrhages**, **relaxed uvula** and sore throat, **spongy granulations**, **diabetes**, prolapsus ani, bleeding hemorrhoids, leucorrhœa, menorrhagia, hæmoptysis.

Generally white oak bark is used locally, in decoction, for the general purposes of an astringent, but it is also tonic and antiseptic, and possesses specific powers.

In severe epidemic dysentery, a strong decoction of white oak bark, given internally, in doses of a wineglassful every hour or two, the bowels being first evacuated by a cathartic of castor oil and turpentine, has effected cures where other treatment had proved of little or no avail. In intermittent fever it should be given internally.

QUERCUS ALBA.

In **marasmus, cholera infantum**, scrofula, and diseases attended with great exhaustion, baths medicated with white oak bark, accompanied by brisk friction, have restored the waning powers of life.

When employed as a local application to **ill-conditioned ulcers** and gangrene, either a poultice of the ground bark, or cloths wet with the decoction may be applied.

In pulmonary and laryngeal phthisis a very fine powder of the bark may be inhaled.

In sore throat the decoction should be used as a gargle.

When the remedy is given internally in diarrhœa and dysentery, it should be combined with cinnamon or other astringent aromatic.

CAJUPUT,

MELALEUCA CAJUPUTI.

Part Employed—The volatile oil.

Natural Order—Myrtaceæ.

Locality—East India Islands.

Botanical Description—The oil of cajuput is distilled from the leaves of various species of melaleuca, but its chief source is the melaleuca cajuputi, a tree indigenous to the Moluccas and adjacent islands; stem erect, crooked, branched, with twigs drooping like the weeping willow; bark of a whitish ash color, thick, soft, spongy, lamellated, throwing off its exterior layer from time to time in flakes; leaves alternate, lanceolated, deep green, short petioled, narrow, three to five inches long, falcate; flowers small, white, odorless, in terminal, downy, axillary spikes, with solitary, lanceolate, three-flowered bracts; calyx urn-shaped; corolla white, orbicular; filaments thirty or forty, three or four times longer than the petals; anthers ovate-cordate; style, longer than the stamens; stigma, three-lobed; capsule, three-celled, three-valved; seeds numerous, angular, cuneate.

Oleum Cajuputi—Oil of cajuput. This oil is obtained from the leaves collected in autumn, by steeping over night in water, and then distilling in copper vessels. It is transparent, of a bluish-green color, a strong, penetrating odor, and a warm, aromatic, pungent, bitter, camphoraceous taste. There is a trace of copper in most specimens. The yield is small, and the oil is correspondingly expensive. The oil of commerce is imported from the East Indies. Solvent, alcohol. Dose, from two to ten minims.

CONSTITUENTS—Cajeputene, iso-cajeputene, and para-cajeputene.

PREPARATIONS—Spiritus Cajuputi, Spirit of Cajuput. Dose, one fluid dram. Mistura Cajuputi Composita, compound Cajuput.

put Mixture. (Hunn's Life Drops). Dose, from one to two fluid drams. Tinctura Camphoræ Composita, Compound Tincture of Camphor. Dose, twenty drops.

Therapy—It is used in the typhoid state, in the stage of collapse in Asiatic cholera, in exhaustion from cholera infantum, the typhoid condition in malignant scarlet fever, flatulent colic from cold, dyspepsia with flatulence, spasms in the stomach and bowels, cholera morbus, rheumatism from cold, chronic rheumatism of joints; dysmenorrhœa from temporary congestion, chronic laryngitis, chronic bronchitis, chronic catarrh of the bladder, functional paralysis, nervous vomiting, dysphagia, dyspnœa and hiccough, intestinal worms, scaly skin diseases,—psoriasis, pityriasis, acne rosacea,—deafness, earache, toothache.

Oil of cajuput is a diffusible stimulant of great power, and is indicated in all depressed and collapsed states of disease where there is no inflammation; such as we find in the advanced stage of adynamic **fevers** and **malignant diseases**. It is a local stimulant, and hence is useful in the treatment of chronic inflammation of mucous membranes, as in chronic laryngitis, chronic bronchitis, and chronic inflammation of the bladder. It is a vermifuge, and may be used to destroy intestinal worms. It is antispasmodic, and is one of the most successful remedies ever employed in the painful cramps of **Asiatic cholera**. It is equally efficient in **cholera morbus**, **cholera infantum**, nervous vomiting, hysteria, and wherever there is depression of the vital powers associated with spasmodic action. It is an antiferment, and is suitable for those cases of feeble digestion with flatulence from fermentation in the stomach and bowels. It is analgesic and relieves the pain of neuralgia and rheumatism, when used as a local application. It is a parasiticide, and has cured skin diseases depending on a vegetable parasite; while it acts as a local stimulant at the same time.

It is important that there should be no inflammation present when cajuput is employed; and when it is given internally in such complaints as cholera morbus, or spasms of the bowels, care should be taken not to excite inflammation of the stomach by a too free use of the remedy.

It has long been employed in Oriental countries as a stimulant diaphoretic, antispasmodic and analgesic (locally) in dropsy, rheumatism, palsy, and hysteria; and it has been used by Western nations with advantage in the treatment of chronic rheumatism, hysteria, colic, spasm, cramps in the stomach and bowels, cholera morbus, Asiatic cholera, and the typhoid state.

Its action is similar to prickly ash as a stimulant.

In the combinations known as Hunn's Drops and the compound liniment of camphor it has been widely employed by our physicians.

In Asiatic cholera oil of cajuput, in various combinations, is an established means of treatment among Eclectics. It stops the spasms, overcomes the collapsed condition, and in many cases effects complete reaction. In like manner it controls the vomiting, cramps and diarrhoea in cholera morbus and allied diseases.

In earache and deafness it may be combined with olive oil and introduced on cotton into the auditory canal.

In acne rosacea, psoriasis and other scaly skin diseases the oil, undiluted, should be applied to the diseased skin three times a day.

In toothache the oil should be applied to the cavity of the tooth on cotton.

In neuralgia the oil should be applied to the seat of pain.

In chronic rheumatism, bruises, sprains, contusions, chilblains, lameness, and other painful affections, the compound tincture (liniment) of camphor, well rubbed in before the fire, will be found to afford great relief. Rheumatism, or pains of a neuralgic character, are often caused by taking cold; here the internal administration of salicin in doses of ten or twenty grains, repeated every hour or two till the system is thoroughly under the influence of the remedy, with the local use of cajuput, or the rheumatic liniment, rubbed in as above directed, will afford relief.

In treating nausea from atony, and in other cases, it is a good rule to give repeated doses till there is a sense of warmth felt in the stomach, and then stop giving the medicine for a time, renewing it again if necessary.

The oil of cajuput and its preparations may be given on sugar, or mixed with honey, or in an emulsion, or in warm brandy and water.

PINUS.

PINUS CANADENSIS.

Synonym—Hemlock spruce.

Part Employed—The fresh inner bark, the resinous exudation and the volatile oil.

Natural Order—Conifera.

Locality—Northern United States.

Botanical Description—The hemlock spruce, *abies canadensis*, or *pinus canadensis*, is a common forest tree, sixty to eighty feet high; trunk large in proportion, straight; bark rough; branches horizontal, young ones drooping; twigs pubescent; leaves half an inch long, flat, obtuse, obscurely denticulate, bright-green above, glaucous beneath, in two opposite rows, forming a light and spreading spray; cones elliptic-ovoid, a half to two-thirds inches long, terminal, drooping, with a few rounded entire scales; bracts very short and hidden. The inner

bark has a mild terebinthinate odor, and a bitterish, astringent taste. Solvents, dilute alcohol, water.

CONSTITUENTS—Tannic acid, resin, volatile oil.

Canada pitch, or gum hemlock, is the prepared concrete juice of the *pinus canadensis*. The juice exudes from the tree, and is collected by boiling the bark in water, or boiling the hemlock knots, which are rich in resin. It is composed of one or more resins, and a minute quantity of volatile oil. Canada pitch of commerce is in reddish-brown, brittle masses, of a faint odor, and slight taste.

Oil of hemlock is obtained by distilling the branches with water. It is a volatile liquid, having a terebinthinate odor and taste.

PREPARATIONS—Canada Pitch Plaster, Tincture of the fresh hemlock boughs, Tincture of the fresh inner bark.

Specific Pinus. Dose, from five to sixty minims.

The hemlock spruce produces three medicines; the gum, used in the form of a plaster as a rubifacient in rheumatism and kindred complaints; the volatile oil—oil of hemlock—or a tincture of the fresh boughs, used as a diuretic in diseases of the urinary organs, and wherever a terebinthinate remedy is indicated; and a tincture of the fresh inner bark, an astringent with specific properties, used locally, and internally in catarrh.

Therapy—Gastric irritation and vomiting in cholera morbus, leucorrhœa, prolapsus uteri, chronic diarrhœa and dysentery, irritation of the urinary organs, croup, rheumatism, eczema, asthenic catarrhal conditions, with feeble digestion, and pallid mucous membranes, profuse bronchial secretion; diabetes, menorrhagia, hæmoptysis, hæmaturia, phthisis pulmonalis, sciatica, lumbago, pleurisy, sprains, bruises, swellings, tumors, orchitis from mumps, gangrene.

The oil of hemlock is commonly used as a liniment in local inflammations, such as croup, lumbago, sciatica, sprains, bruises and rheumatism.

A tincture from the fresh boughs, or the oil, is diaphoretic and diuretic, and may be employed internally, and as a medicated vapor bath in rheumatism, pleurisy, orchitis from mumps, peritonitis, and all inflammations caused by cold. Internally it may be given in the gastric irritation of cholera morbus, and in irritation of the urinary organs. The oil, full strength, may be applied with advantage in herpes, moist eczema, fevers and psoriasis. It is also a good stimulating expectorant in chronic bronchitis and chronic coughs.

The ground bark is useful as a poultice in gangrene, and in the form of a fine powder has been inhaled with benefit in pulmonary phthisis.

A tincture of the fresh inner bark of the hemlock may be employed in obstinate leucorrhœa, diluted with two parts of

water, being applied to the vagina on cotton, at intervals of several hours, so as to get a continuous effect.

Internally it may be given in catarrh of the lungs and bowels after the inflammatory stage, when the mucous membrane is relaxed, the secretion of mucus excessive, and the system feeble.

GROUP VI.

Agents Influencing the Character of the Blood.

CHAPTER I.

ECHINACEA.

BERBERIS AQUIFOLIUM.

DULCAMARA.

BAPTISIA.

AILANTHUS GLANDULOSA. CALOTROPIS GIGANTEA.

ECHINACEA.

ECHINACEA ANGUSTIFOLIA.

Synonym—Black Sampson, cone flower.

Part Employed—The root.

Natural Order—Compositæ.

Location—Western United States.

Botanical Description—It grows through the central and western portions of the United States, especially on the elevated tablelands, and in the northern portions, where it was known to the Indians as a cure for snake poison.

It is a perennial herb with thick, black roots of pungent taste. It has a stout, erect stem, either sparsely or densely hispid, mostly simple; leaves from broadly lanceolate to nearly linear, entire, three-nerved, all attenuate at the base, the lower in slender petioles; bracts of the involucre in only two series, lanceolate; disk at first only convex, becoming ovoid, and receptacle acutely conical; chaffy bracts firm and completely persistent, linear-lanceolate, carinate, concave, acuminate into a rigid and spinescent crisp, surpassing the disk flowers; ligules elongated and pendent, rose-colored or rose-purple, marcescent, usually imperfectly styliferous; disk corollas cylindraceous, with five erect teeth, and almost no proper tube (a ring upon which the stamens are inserted); achenes superposed cartilaginous, acutely quadrangular, somewhat obpyramidal with a thick

coroniform pappus, more or less extended into triangular teeth at the angles; the basal areola central.

PREPARATIONS—Fluid extract of the root, miscible with water without material precipitation. Dose, one-fourth to one-half fluid dram.

Specific Echinacea. Dose, five to thirty drops.

Echafolta is a purified, assayed form of Echinacea. The dosage of both is the same. Externally or for surgical purposes it is greatly superior to any other preparation of Echinacea. It is prescribed for the same conditions.

For from ten to fifteen years, Echinacea has been passing through the stages of critical experimentation under the observation of the entire school of Eclectic physicians, and its remarkable properties are receiving confirmation. As yet, but few disparaging statements have been made. All who use it fall quickly into line, as enthusiasts in its praise; the experience of the writer is similar to that of the rest, the results in all cases having been satisfactory, and in some almost bordering on the miraculous.

Physiological Action—When a half teaspoonful dose of the tincture is taken into the mouth, a pungent warmth is at once experienced which increases to a tingling, and remains for half an hour after the agent is ejected. It is similar to that of aconite, but not so much solely of the nerve-end organs. The sensation is partly of nerve tingling, and more from an apparent mild nerve irritant effect. It much more resembles the action of xanthoxylum. If a small quantity be swallowed undiluted, it produces an apparent constriction of the throat, sensation of irritation, and strangulation, much greater in some patients than in others, and always disagreeable. The sensation persists for some minutes, notwithstanding the throat is gargled, water is drunk, and the agent entirely removed.

It promotes the flow of saliva in an active manner. The warmth and tingling extend down the esophagus to the stomach, but no further unpleasant influence is observed. In a short time diaphoresis is observed, and the continuation of the remedy stimulates the kidneys to increased action. All of the glandular organs seem to feel the stimulating influence, and their functional activity is increased. The stomach is improved in its function, the appetite increases, the food is more perfectly digested, the bowels operate better, and absorption, assimilation, and general nutrition are materially improved. It encourages secretion and excretion, preventing further auto-intoxication, and quickly correcting the influence in the system of any that has occurred. It stimulates retrograde metabolism, or tissue waste, more markedly than any other single remedy known. It influences the entire lymphatic system, and the condition of the blood suggests that the patient has been taking stimulants,

liver and iron remedies in abundance. Sallow, pallid and dingy conditions of the skin of the face quickly disappear, and the rosy hue of health is apparent. Anæmic conditions improve, with increased nerve tone. There are but few subjective symptoms from large doses of this agent. It is apparently non-toxic, and to any unpleasant extent non-irritant. The agent certainly has a most marked effect upon the nervous system, but its specific influence upon the central organs has not yet been determined.

Specific Symptomatology—It is the remedy for **blood poisoning**, if there is one in the *Materia Medica*. Its field covers acute auto-infection, slow progressive blood taint, faults of the blood from imperfect elimination of all possible character, and from the development of disease germs within the blood. It acts equally well, whether the profound influence is exerted upon the nervous system, as in puerperal sepsis, and uræmia, or whether there is prostration and exhaustion, as in pernicious malarial and septic fevers, or whether its influence is shown by anæmia, glandular ulceration or skin disease.

It is especially indicated where there is a tendency to gangrenous states and sloughing of the soft tissues, throat dark and full, tongue full, with dirty, dark-brown or black coat, in all cases where there are sepsis and zymosis.

It undoubtedly exercises a direct sedative influence, over all of the fever processes in typhoid, cerebro-spinal meningitis, malarial fevers, asthenic diphtheria, etc., for while it equalizes the circulation, it also acts as a sedative to abnormal vascular excitement and lowers the temperature, if this be elevated, while, if this be subnormal, the singular effect upon the vital forces conspires toward a restoration of the normal condition.

As a sedative it is comparable in some respects with baptisia, rhus and bryonia.

Therapy—As an **intestinal antiseptic** the agent is bound to take first rank with all physicians when once known. Experiments with it to determine its immediate influence upon the fevers caused by continued absorption of septic material, such as **typhoid fever**, **puerperal fever**, and the fever of the after-stages of diphtheria, show that its destructive influence upon the pernicious germs begins at once.

In several cases reported, where special sedatives were not given, the temperature has declined from one-half to two degrees within a few hours after its use was begun, and has not increased until the agent was discontinued.

It has then slowly increased toward the previous high point until the remedy was again taken, *when* a decline was soon apparent.

It does not produce abrupt drops in the temperature, as often follows the curetting of a septic womb, or as the removal of a

quantity of septic material often causes, but it effects an almost immediate stop to germ development, and a steady restoration from its pernicious influence. In the treatment of typhoid fever in the Cook County Hospital, Chicago, it has been in almost constant use in the Eclectic wards for about two years at this writing, and twenty-one days is the extreme extent of the fever, and the mortality has been the lowest known. In many cases taken early, the fever has been limited to fourteen days, without delirium.

In private practice the reports of many physicians are much more enthusiastic, claiming that when given in the initial stage the fever has disappeared in seven days, and that fourteen days are the extreme limit. The blood does not become impaired, the assimilation and nutrition are remarkably increased, the nerve force is retained, elimination from all organs is improved, ulceration of Peyer's glands ceases, the enteric symptoms abate, there is but little, if any, tympanites, and there has as yet been no case of hemorrhage or perforation reported as having occurred after the agent was begun. It certainly is a valuable acquisition to **typhoid** therapeutics.

Its influence in **septic fevers** is the same as in typhoid. It seems to act as a nerve stimulant upon the vital forces depressed by the poison. This fact was especially true in a case where extreme septic absorption after a badly conducted abortion caused acute nephritis and suppression of the urine. Uræmia supervened, with delirium and mild convulsions. Twenty drops of the fluid extract of Echinacea were given every two hours continuously. Extreme heat was applied over the kidneys, and a single dose of an antispasmodic was given, the Echinacea alone being continued. The fever dropped in two days, the mind cleared, the urinary secretion was restored, and the patient made a rapid and uninterrupted recovery.

It is a most important remedy in **uræmic poisoning**, and will supersede all other single remedies.

It has been in constant use in **diphtheria** for three years. It is used locally as well as internally. The exudates contract and disappear, the local evidences of septic absorption are gone, the fever declines, the vital forces increase, depression, mental and physical, disappears, and the improvement is continual. In **ulcerated sore throat** of any character, in **ulcerated sore mouth**, in **stomatitis materna**, in **post-nasal** or **catarrhal ulcerations** it is prompt and effectual. It is preferred in these cases by those who use it to any previously known agent.

In local inflammation of any portion of the intestinal tract, it has given excellent satisfaction. It quickly overcomes local blood stasis, prevents or cures ulceration, and retards pus formation by determining resolution. Reports of its use in **appendicitis** have been extremely satisfactory. One writer

treated several cases of unmistakable diagnosis, and a satisfactory cure resulted. The writer treated one marked case of appendicitis where pus formation and future operation seemed inevitable. The improvement was apparent after the agent had been taken a few hours, and recovery was complete in twelve days from attack.

Its use in **cholera infantum** has been satisfactory, especially if nervous phenomena are present. The frequent discharges gradually cease, the patient is soothed and the nerve force increases as the fever abates. Extreme nervous phenomena do not appear.

Webster, of San Francisco, in 1892, suggested the use of Echinacea in **spinal meningitis**. It should be especially valuable if any blood dyscrasia lie at the bottom of the difficulty. Following Webster's suggestions, other physicians, from their personal observations, have been able to ascribe undoubted curative virtues to this agent in this and other convulsive and inflammatory disorders of the brain and cord.

As a sedative in cerebro-spinal meningitis, Webster is disposed to believe that it specifically influences the vascular area concerned in the nutrition of the cerebro-spinal meninges. Its influence upon the capillary circulation is not comparable with that of any other known remedy, for while it is a stimulant to the circulation in these vessels, it also seems to endow them with a certain amount of recuperative power or formative force by which it is constituted, not only a general stimulant and tonic to the circulation, but also peculiarly so to local inflammations of a debilitating or depressing character.

In the treatment of **erysipelas** it has given more than ordinary satisfaction, and has established itself permanently in that disorder. It is especially needed when sloughing and tissue disintegration occur, its external influence being most reliable.

In the pain of **mammary cancer** and in the **chronic inflammation** of the mammary gland, the result of badly treated puerperal mastitis, where the part has become reddened and congested, the remedy has worked most satisfactorily.

In **bed sores**, **fever sores**, and in **chronic ulcerations** it is exceedingly useful. It is diluted and applied directly, while it is given internally. It is of much value in **old tibial ulcers**, in **chronic glandular indurations**, and in **scrofulous** and **syphilitic nodules** and other specific skin disorders. The extract or the fluid extract can be combined with an ointment base such as lanolin in the proportion of one part to one, two, or three parts of the base, and freely applied. It can be injected into the **sinuses of carbuncles**, or into the structure of the diseased parts with only good results.

Logan treated ten cases of stubborn skin disease of undoubted syphilitic origin with this remedy alone. It was ap-

plied externally and given in full doses internally, with a satisfactory cure in every case.

In the treatment of **syphilis** very many observations have been reported. It has been used entirely alone and also in conjunction with alterative syrups, but in no case yet reported has mercury been used with it. The longest time of all cases yet reported needed to perfect the cure was nine months. Every observer reported himself more than satisfied with its influence.

The writer's observations, in all cases he has treated, are that the patient begins to feel a general improved condition after taking the remedy a few days. Some of them are enthusiastic concerning the sense of well-being they experience. It begins by removing all the sensations of discomfort, and the patient's mind becomes hopeful and encouraged. The specific fever in the first stages soon declines, and there is a permanent abatement of all of the evidences of the disease. There are absolutely no undesirable influences observed, and no after effects, and no undesirable side influences to overcome. It combines, in one remedy, the influences of all the agents usually needed to complete a cure.

Its influences are in no way enhanced by the use of the iodides. On the other hand, the writer has had more satisfactory results, where the iodides have been given in conjunction with it, after the iodides were withdrawn, and the echinacea continued alone. The rapid amelioration of the disorders of the skin, after the withdrawal of the iodides, was especially remarked.

The following most remarkable case occurred in the author's practice:

A gentleman, aged about forty-five years, in apparently good health, was vaccinated, and as the result of supposed impure virus a most unusual train of the symptoms supervened. His vitality began to wane, and he became so weak that he could not sit up. His hair came out, and a skin disease pronounced by experts to be psoriasis, appeared upon his extremities first, and afterward upon his body. In the writer's opinion, the condition had but little resemblance to psoriasis. It seemed more like an acute development of leprosy than any other known condition.

This advanced rapidly, his nails began to fall off, he lost flesh, and a violent iritis of the left eye developed with ulceration of the cornea in the right set in, and for this difficulty, he was referred to Prof. H. M. Martin, president of the Chicago Ophthalmic College.

Dr. Martin gave him ten grains of the iodide of potassium three times daily, and fed him freely upon phospho-albumin. The loss of hair was stopped, but no other favorable results

were obtained. The condition progressed rapidly towards an apparently fatal termination. At this juncture, Dr. Martin asked the writer to see the case with him. It looked as if there was no possible salvation for the patient, but as a *dernier ressort*, the writer suggested **echinacea** twenty drops every two hours, and the phospho-albumin to be continued.

For perhaps ten days, there was no apparent improvement. The patient was confined to his bed, being too prostrated to sit up. The nails on both hands and feet and the thick skin from the soles of his feet and the palm of his hands came off entirely, and he lost the sight of his left eye, but after the first few days, after he was put on echinacea, there was no advancement in the disease, and finally a slow improvement set in. His appetite increased, his vitality returned, the right eye was restored to its normal condition, and he began to gain in flesh.

Dr. Martin being called away, he sent the patient back to his previous physician, who continued the treatment with the addition of the iodide of iron, but both of the physicians attribute the marvelous results to the action of echinacea, of which about sixteen ounces were given, twenty drops at a dose. The patient has regained his normal weight of more than two hundred and twenty pounds, eats well, sleeps well, rides his bicycle, and enjoys as good health as ever in his life.

Echinacea has been used with great success in aggravated and prolonged cases of rhus poisoning, both locally and internally.

The agent has been long in use among the Indians in the West as a sure cure for **snake bite**. It has created a furor among the practitioners, who have used it in the **bites of poisonous animals**, that has made the reports, apparently, too exaggerated to establish credulity on the part of the inexperienced. Cases that seemed hopeless have rapidly improved after the agent was applied and administered. There is at present no abatement in the enthusiasm. One physician controlled the violent symptoms from the bite of a tarantula, and quickly eliminated all trace of the poison with its use.

In a paper read at the Ohio State Eclectic Medical Society in 1895, Dr. Gregory Smith stated that in 1871 Dr. H. C. F. Meyer commenced the use of this remedy.

He says: "In malarial troubles it has no superior." He also recommends it as a remedy for **hemorrhoids**; twenty-five drops of the pure tincture injected into the rectum three times a day promptly effect a cure. "It is also prompt in stings from insects and in poisoning by contact with certain plants." As an antidote to the venom of the *crotalus horridus* it stands without a peer. He gives the history of 613 cases of rattlesnake bite in men and animals, all successfully treated. With the courage of his convictions upon him he injected the venom of the *crotalus* into the first finger of his left hand; the swelling was rapid,

and in six hours was up to the elbow. At this time he took a dose of the remedy, bathed the part thoroughly, and laid down to pleasant dreams. On awakening in four hours the pain and swelling were gone.

The fresh root scraped and given freely is the treatment used by the Sioux Indians for snake bite. Recoveries from crotalus poisoning are effected in from two to twelve hours.

By far the most difficult reports to credit are those of the individuals bitten by **rabid animals**; there are between twenty and thirty reports at the present time. In no case has **hydrophobia** yet occurred, and this was the only remedy used in many of the cases. In five or six cases, animals bitten at the same time as the patient had developed rabies, and had even conveyed it to other animals, and yet the patient showed no evidence of poisoning, if the remedy was used at once. One case exhibited the developing symptoms of hydrophobia before the agent was begun. They disappeared shortly after treatment. In no case has an opportunity offered to try the remedy after the symptoms were actually developed. One poorly nourished anæmic and jaundiced child was badly bitten and the treatment improved the general condition in a marked manner.

Although subsequent developments will not be likely to sustain the exaggerated statements of enthusiastic observers, there is no room at the present time for doubt as to the leading position this agent will take in the conditions named above, and as to its vital importance in the therapeutics of these conditions.

BAPTISIA.

BAPTISIA TINCTORIA.

Synonym—Wild indigo.

Part Employed—Bark of the root and leaves.

Natural Order—Leguminosæ.

Locality—United States.

Botanical Description—*Baptisia Tinctoria* is a perennial plant, growing in dry, waste places, and flowering in July and August; stem one to three feet high, smooth, very much branched, round, glaucous, succulent; leaves trifoliate, small, ternate, bluish-green; leaflets three-fourths of an inch long, cuneate-obovate; stipules minute, caducous; flowers yellow, in small, loose racemes; calyx somewhat bell-shaped, bilabiate; standard erect, reflexed on the sides, about equalled by the oblong and straightened wings and keel; pods inflated, coriaceous, stalked in the calyx, many seeded; seeds small, sub-reniform; rhizome blackish and woody, yellowish internally, sending off small rootlets. It consists of a knotty head, two to three inches broad, with broad stem scars above, and divided

below into several branches about half an inch in diameter, sparingly beset with branching fibers; bark warty, internally whitish, with a soft corky layer; wood tough, medullary rays indistinct; wood nearly inodorous; bark bitter, acrid, nauseous. Solvents, alcohol, water. Dose, from five to fifteen grains.

CONSTITUENTS—Baptisin (a bitter glucoside), baptin (a purgative glucoside), baptitoxin (a poisonous alkaloid), resin, fixed oil.

PREPARATIONS—*Extractum Baptisæ Alcoholicum*, Alcoholic Extract of Baptisia. Dose, from one to four grains.

Specific Baptisia. Dose, from one-fourth to ten minims.

Physiological Action—When fresh and taken in a sufficiently large dose Baptisia causes violent vomiting and purging. In poisonous doses there is acceleration of respiration and reflex activity followed by death from central paralytic asphyxia.

Specific Symptomatology—In **low fevers** with dark or purplish mucous membranes of the mouth, tongue dry and thin, with a dark coating, face dusky and suffused, circulation feeble.

Therapy—With the above indications the agent has been widely used for many years by our practitioners in the treatment of typhoid conditions, and has established its position as an important remedy.

It has an apparent dynamic influence upon the glandular structure of the intestinal canal, directly antagonizing disease influences here, and, re-enforcing the character of the blood, prevents the destruction of the red corpuscles, and carries off waste material. In malignant tonsillitis and diphtheritic laryngitis it has been long used with excellent results. In **phagedena** with gangrenous tendencies wherever located, it has exercised a markedly curative influence.

It is useful in **dysentery** where there is offensive breath and fetid discharges of a dark prune juice character.

In **scarlet fever**, with its specific indications, it is a useful remedy. Large doses are not necessary, but it should be employed early and the use persisted in.

In the treatment of **low fevers** this agent is said to exercise marked sedative power over the fever. Homeopathic physicians prescribe it to control the fever. There is no doubt that in proportion as the cause of the fever is destroyed the temperature abates. An inhibitory influence directly upon the heart and circulation cannot be attributed to it, yet it soothes cerebral excitement to a certain extent, having a beneficial influence upon delirium.

AILANTHUS.

AILANTHUS GLANDULOSA.

Synonym—Chinese Sumach, Tree of Heaven.

Part Employed—The bark.

Locality—Indigenous to China and Japan. Cultivated in Europe and the United States. The bark is tough and fibrous, brownish-gray externally, yellowish internally.

Administration—The powder is of greenish-yellow color, strongly narcotic odor, nauseating, strongly bitter taste. The dose is from five to thirty grains.

Specific ailanthus, is prescribed twenty drops in four ounces of water; a teaspoonful every hour or two hours.

The extract is given in doses of from one to five grains. The fluid extract in from five to twenty minims.

Physiological Action—In over doses, ailanthus causes vertigo, severe headache, pains in the back and limbs, together with great prostration, tingling and numbness; it reduces the pulse-beat and the respiration, and causes great weakness, cold sweats and shivering. If it be given too frequently, or in too large doses, it causes death by paralyzing the respiratory center, its influence resembling that of tobacco. It is said that both quassia and gentian intensify its action, and that it should not be administered with either iron or lead compounds.

The presence of ailanthus in a malarial locality, like eucalyptus, will correct the malarial influence of that locality.

Specific Symptomatology—Its indications are similar to those of rhus tox. It is a valuable agent, but its therapeutic influence is not fully determined. It is yet in the experimental stage to a certain extent.

It is indicated in cases in which all the evidences of sepsis are quite pronounced or prominent, such as a dusky eruption, dirty, dry, cracked tongue, malignant sore throat and tonsils, with sordes on the teeth, and excoriating discharges from the nose and mouth, bad respiration, and adynamic persistence of disagreeable symptoms telling of blood-poison; in atonic conditions of the nerves, or of the mucous membranes of the body, or great general weakness and prostration. It should be classed as an antiseptic, and in the same class with baptisia, echinacea, etc.

Therapy—It is of much service in **scarlet fever**, especially the malignant form, in **typhoid**, and other types of low fever and in low forms of acute inflammation. With special reference to the action of ailanthus as a tonic to the nervous system, it is efficient as a remedy in some cases of **asthma** as well as in **epilepsy**, and in many cases of epileptiform contraction of the muscles, etc. Frequently ailanthus will relieve nervous palpitations and severe cases of singultus, that for a long time have withstood other remedies.

With the Chinese, a decoction of ailanthus is a most favored remedy in **tapeworm**, **dysentery** and diarrhœa. Because of its special tonic effect on mucous membranes it is an excellent remedy in some cases of leucorrhœa, etc. For the same reason it has been highly praised as a remedy in many dyspeptic troubles

BERBERIS.

BERBERIS AQUIFOLIUM.

Synonyms—Oregon grape, mountain grape.

Part Employed—The root and berries.

Natural Order—Berberidacea.

Locality—Pacific coast of North America.

Botanical Description—Berberis aquifolium is a shrub rising three or four feet from the ground; leaflets five inches long, shining, finely reticulated. The root occurs in pieces about a foot long, and from the size of a quill to an inch or two in diameter, crooked, knotty, yellowish-brown externally and yellow internally; bark thin; wood tough, yellow, with five medullary rays and a distinct pith. Solvent, alcohol. Dose, from five to twenty grains.

CONSTITUENTS—Berberine, oxyacanthine, berbamine tannin fat, resin.

PREPARATIONS—Extractum berberidis aquifolii fluidum. Fluid extract of berberis aquifolium. Dose, from five to twenty minims.

Administration—The active principle of the agent is apt to precipitate if a combination is made with the iodide of potassium, as is often done with other vegetable alteratives. To avoid this the iodide solution should be rendered slightly alkaline by adding a few drops of the liquor potassæ before the combination is made.

Physiological Action—In overdoses in some cases the agent produces tremor of the limbs, lack of muscular power, dullness of the mind, drowsiness and active diuresis. It is not a poisonous agent.

Its influence upon the secretion of the entire glandular structure of the digestive and intestinal tract is steady, sure, and permanent, although not always as immediately marked as some other agents.

It stimulates all the glandular organs of the body. It stimulates digestion and absorption, and thus improves general nutrition. It materially stimulates waste and repair. In spite of these recommendations, since the death of Dr. Bundy, its introducer, this agent has been neglected.

The agent is classed among the alteratives, and its alterative properties stand first, but its pronounced tonic influence will be

quickly observed. It overcomes weariness, "that tired feeling," produces a sense of vigor and general improved tone and well-being.

Specific Symptomatology—The specific action of this agent is in scaly, pustular and other skin diseases due to the disordered condition of the blood. It is the most reliable alterative when the influence of the dyscrasia is apparent in the skin. It is given freely during the treatment of skin diseases where an alterative is considered an essential part of the treatment.

Therapy—It has cured persistent acne for the writer when no local treatment was used. It contributes to the removal of **pimples** and **roughness** and promotes a clear complexion, a soft, smooth and naturally moist skin in sensitive young ladies, when the cause is not a reflex one from **ovarian** or **uterine** irritation, or menstrual irregularity.

It seems of especial value in scaly skin diseases and in disorders of a non-inflammatory type, and yet it works nicely in some cases of the moist variety.

It has cured very many cases of **salt rheum** even when the symptoms were chronic in character and greatly exaggerated.

In moist eczema it has acted most satisfactorily, but has usually been given in conjunction with other treatment. Dr. Soper, in 1884, reported in the *Therapeutic Gazette* a most intractable case of moist eczema of an acute character covering the entire body. No other alterative was given. The case was cured in four weeks. In **eczema capitis**, **eczema genitale** with **pruritus**, and in **scaly eczema** of all kinds it has been given alone and has acted promptly and surely.

It has cured chronic cases of **scald head**, so called, in a few weeks, restoring tone and vigor to the hair.

It has been often used in **acne**, and has worked nicely when local or reflex irritation was not the cause.

In **psoriasis** and in **pityriasis** it has won the praise of many doctors. For **dandruff** it has been given internally and has produced cures in a number of cases.

In many instances various forms of **chronic dermatosis** have yielded to its influence when other treatment has failed.

It should be prescribed in glandular indurations and chronic ulcerations, both of a scrofulous and syphilitic type, giving excellent results in these cases. It is lauded highly in **syphilis**, though it has seldom been given alone in this condition, but usually with other vegetable alteratives, the value of which, however, it has seemed to greatly enhance.

When first introduced it was recommended in chronic malarial conditions, in intermittent fever, and in the stomach, liver, intestinal and general glandular disorders of this condition. It was claimed that its tonic influence was conspicuous in these conditions and that in certain cases it exercised marked

antiperiodic properties. It certainly acts as a tonic and corrective to disorders of the liver, an influence that has been often remarked when given for skin diseases.

DULCAMARA.**SOLANUM DULCAMARA.**

Synonyms—Bitter-sweet, woody nightshade.

Part Employed—The young branches.

Natural Order—Solanaceæ.

Locality—Europe, Asia, North America.

Botanical Description—Bitter-sweet is a climbing shrub, growing in low, damp grounds, and flowering in June and July; stem woody, slender, fifteen to twenty feet high, branching, bark ashy-green; leaves alternate, upper ones hastate, lower cordate, petiolate, slightly pubescent beneath, pointed, veined, smooth, entire, color dull-green; flowers wheel-shaped, arranged in clusters analogous to cymes, purple, drooping, calyx very small, corolla five-lobed; fruit a scarlet oval berry, many seeded. The twigs should be gathered in autumn after the leaves have fallen, and when two years old. As found in the market, they are in short sections, one-fifth inch thick, cylindrical, longitudinally furrowed, warty, greenish-gray, corky layer easily removed, showing the bark dark-green beneath; wood has one or two annular rings; odor narcotic, unpleasant; taste bitter, afterward sweet. Solvents, diluted alcohol, water. Dose, from one to two drams.

CONSTITUENTS—Dulcamarin, solanine, gum, resin, wax.

PREPARATIONS—Extractum Dulcamaræ Fluidum, Fluid Extract of Dulcamara. Dose, from half to one dram.

Specific Dulcamara. Dose, from one-half to ten minims.

Potatoes and tomatoes belong to this family, and although the fruit is edible, the vines are usually poisonous.

Solanine may be obtained from the new sprouts of the ordinary potato.

Physiological Action—This agent is a powerful poison to all living protoplasm. It coagulates the blood and destroys the integrity of the corpuscles.

Injected into the veins it causes dyspnoea, thrombosis in the vessels and arrest of respiration. Toxic doses produce tremors, muscular contractions, central paralysis, collapse, coma, a violent fall of the temperature, and death.

It is a narcotic, and in toxic doses causes nausea, vomiting, faintness, pain in the joints, numbness of the limbs, dryness of the mouth, convulsive movements, a small, hard pulse, paralysis of the tongue, a purplish color of the face and hands, twitching of the eyelids and lips, trembling of the limbs, erythematous eruption, suppression of venereal desire, though recovery

has followed after very large doses. Clarus administered six grains of solanine, which produced general cephalic distress, with occipital pain, increase of the frequency and loss of the force of the pulse, followed after some hours by sudden vomiting, diarrhoea, great weakness, and marked dyspnœa.

Its action resembles that of strychnia and picrotoxine to a limited extent. Its therapeutic influence is not comparable with that of these agents.

Therapy—Dulcamara is a remedy for all conditions resulting from **suppression of secretion**, from **exposure to cold** and dampness. It will restore normal excretion and secretion.

In acute **coryza**, in **bronchial** and **nasal catarrh**, in lung congestion and bronchial cough, with pain in the chest, all from cold, in bronchial **asthma**, and in **acute bronchitis** it is an excellent auxiliary remedy.

In **eruptive fevers** it assists in determining the eruption to the surface, especially if there is retrocession. It has a direct action upon the skin also, being given in **pustular eczemas** and vesicular disorders quite freely. It has produced good results in **psoriasis**, **pityriasis**, **lepra**, and other scaly skin disorders. It acts as an alterative in such cases, and will influence the skin derangements of scrofula and syphilis to a certain extent. It is available in the various skin disorders of childhood from disordered blood and deranged stomach.

It is an excellent alterative, if administered with care, and is therefore valuable in syphilis, scrofula, and other blood disorders. In acute and chronic rheumatism from exposure to dampness and cold, and in gout, it has been advantageously used.

Nervous irritation with depression, with hyperesthesia of the organs, and pruritus pudendi are relieved by it. It may be used in spermatorrhea with undue excitement, priapism, nymphomania and satyriasis. It should be given first in small doses, increased to full amount if necessary. In suppression of the menses with headache and nausea and acute ovarian congestion, it will work well.

It is advised in the treatment of catarrh of the bladder, and as a stimulant to the urinary secretion.

CALOTROPIS GIGANTEA.

ASCLEPIAS GIGANTEA.

Part Employed—The bark of the root.

Location—Hindustan, and in the West Indies.

PREPARATIONS—The powdered root. Dose, from six to ten grains three times daily.

The Tincture. Dose, from one drop to five three times daily.

Physiological Action—The milky juice of the plant was used in India for killing female infants.

In large doses, the remedy increases the secretions, produces nausea, vomiting and prostration.

Therapy—It is a powerful alterative, especially in the treatment of chronic skin diseases which depend upon dyscrasias. **Syphilides, elephantiasis, and leprosy** are all said to have been favorably influenced by it.

It has accomplished unmistakably good results in many cases of **syphilis**.

A Homœopathic writer says of this remedy: "I was led to use it with marked success in syphilis, and the progress of the cases was much more favorable than under any former plan. My experience has been entirely confined to from one to five drop doses of the tincture. I have used it for four to five weeks at intervals of three hours, without other than good effects on the disease.

"The primary **anæmia of syphilis** is of common occurrence. My experience with calotropis in this anæmia has been most remarkable. The occurrence of the sense of heat, I have verified in numerous instances, and the patients date their improvement in strength and vigor to the time that they began to feel this sensation."

In **hectic fever** and **dysentery** it has done nicely, as well as in rheumatism. It is growing in favor and may yet prove of superior value.

CHAPTER II.

PHYTOLACCA.

STILLINGIA.

CORYDALIS.

CHIMAPHILA.

LAPPA.

RUMEX.

KALMIA.

FUCUS.

ICHTHYOL.

PHYTOLACCA.

PHYTOLACCA DECANDRA.

Synonym—Poke.

Part Employed—The root, leaves and berries.

Natural Order—Phytolaccaceæ.

Locality—North America.

Botanical Description—Phytolacca is an indigenous perennial plant, growing in waste places throughout the United States, flowering from July to September; stem smooth, round, green when young, purple when mature, fleshy, hollow, four to eight feet high, one to two inches in diameter, with numerous spreading branches; leaves entire, scattered, ovate-oblong, five inches long, three inches wide, smooth, petioled, deep-green, ribbed beneath, both ends acute; flowers white, arranged in long racemes opposite the leaves; fruit when ripe, a deep-purple berry,

compressed, one-third of an inch thick, containing ten carpels, each carpel containing one lenticular black seed, and a quantity of deep-purple juice; root when fresh, large, conical, branched, fleshy, whitish within, easily broken, covered with a brownish bark; taste sweetish, acrid. Solvents, alcohol, water. Dose, from one to ten grains.

The dried root is nearly devoid of medicinal properties, and only a tincture from the fresh root should be employed in medicine.

The berries possess essentially the same medicinal properties as the root.

CONSTITUENTS—Phytolaccic acid, phytolaccine, calcium malate, resin, starch, wax, gum, tannin, mucilage. The ashes contain over fifty per cent of caustic potassa.

PREPARATIONS—Extractum Phytolaccae Radicis Fluidum. Fluid Extract of Phytolacca Root. Dose, from five to thirty minims. Unguentum Phytolaccae, Ointment of Phytolacca. Specific Phytolacca. Dose, from one to ten minims.

Physiological Action—Though the young shoots of Phytolacca are used as greens the mature plant is poisonous when taken in large doses. Death has followed an overdose (one-half ounce) of the berries or root, preceded by excessive vomiting and purging; drowsiness, prickling and tingling over the whole body; vertigo, dimness of vision, cold skin, feeble pulse, great prostration, convulsions and coma.

Specific Symptomatology—The most direct action of this agent is in inflammation of the glandular structures, especially of the **lymphatic glands**. Pains of a rheumatic character from deficient catabolism are relieved by it. It is directly indicated in irritation, inflammation and ulceration of mucous membranes in rheumatic subjects, sanious ulcers, scabies, tinea capitis, sycosis, psoriasis, favus, *noli me tangere*, and all skin diseases. It is especially valuable in the squamous variety of skin diseases.

Therapy—**Inflammation** of the **breasts** in nursing women, pain in the breasts, sore nipples, **diphtheria**, or **tonsillitis**, and inflammation of the throat, with pain in the nape and sides of the neck and root of the tongue, the sore throat of scarlet fever, are relieved by this agent. It is beneficial in the treatment of pain in the abdomen, increased by pressure, from irritation or inflammation of the gastric or intestinal mucous membranes, or of the glandular structures of these membranes, obstinate constipation, or irritation of the bowels resembling cholera, with vomiting, purging and cramps, hemorrhoids, fissure, fistula, ulcer, or induration of the rectum, **influenza**, **catarrh**, and cough from irritation of the respiratory mucous membrane, lupus, epithelioma, and all ulcers of the nose and throat, granular conjunctivitis with circum-orbital pain, bubo, chancre,

mercurio-syphilis (osteoscopic pain), syphilitic skin diseases, syphilitic nodes in the skull, syphilitic ozena, with sanious discharge from disease of the nasal bones, prosopalgia in syphilitic and rheumatic subjects, pain in the bones of the face at night, membranous dysmenorrhœa, uterine and vaginal leucorrhœa, albuminuria, with dropsy, Bright's disease, albuminuria after scarlet fever and diphtheria, pain in the region of the bladder, with dark-red urine, **periostitis** and **orchitis** of rheumatic origin, nervous irritation from teething, headache from gastric irritation, asthenic hyperæmia of the liver, spleen or uterus, **pain** in the region of the **liver**, with enlargement and induration, when the patient cannot lie on the right side because of pain in the right hypochondrium, soreness and pain in the region of the liver in pregnant women, chronic hepatitis.

The action of phylotacca is on the processes of waste and nutrition.

In **tonsillitis** with rheumatic pains over the body it is curative.

An ointment made from the fresh leaves or berries, has cured obstinate ulcers on the face supposed to be cancerous.

In the treatment of inflammation of the breasts of nursing women it is specific as has been stated.

In non-malignant **diphtheria**, and in other diseases where a false membrane forms, it removes the cause and the disease subsides. Ten drops of equal parts of the juice of ripe poke berries and alcohol may be given every thirty minutes in **membranous** and **spasmodic croup** with great success, with other remedies as indicated.

In irritation of the urinary tract, even in conditions resembling Bright's disease, with albumen, and abnormal deposits in the urine, it tends to relieve the irritation, and effect a cure. Skin disease of constitutional origin, and scrofulous skin diseases, are cured by it.

Its action in relieving irritation, inflammation and ulceration of mucous membranes in all parts of the body—throat, larynx, lungs, stomach, bowels and rectum—suggests it as a remedy in inflammation of the lining membrane of the heart; and it is said to have cured cases of this kind.

In conjunctivitis, the local and internal use of the remedy is efficient; and also in the treatment of chancre and bubo.

In the treatment of conjunctivitis, a saturated tincture of the fresh root should be given in sufficient quantity to produce fullness of the temples and head, while the eyes should be bathed frequently with the decoction.

In the treatment of ulcers and ulcerating skin diseases, the local application of a concentrated preparation of the root or berries should be made, so as to exert something of a caustic effect, while full doses are given internally at the same time.

The presence in the blood of an irritant which causes rheumatic pains, as in fibrous or sciatic rheumatism, and irritation of mucous membranes, or inflammation of the throat associated with rheumatic pains, and enlargement and ulceration of lymphatic glands from scrofula or syphilis, is an indication for the remedial action of phytolacca.

It has been thought to stimulate the liver, by those who hold the theory that rheumatism, peritonitis, tonsillitis, and the many diseases assigned to the uric acid diathesis depend upon abnormal protoplasmic change in the blood, as it circulates through the liver; but whether this is true or not, there is no doubt that it improves nutrition.

Phytolacca is somewhat narcotic, and also a nerve stimulant in moderate doses, and this will explain its action in curing rheumatism, for those who take the ground that this obscure disease is a neurosis; and also explains its action in neuralgia.

STILLINGIA.

STILLINGIA SYLVATICA.

Synonym—Queen's delight.

Part Employed—The root.

Natural Order—Euphorbiaceæ.

Locality—United States.

Botanical Description—*Stillingia sylvatica* is a perennial herb, with an angled stem, from two to four feet high, with a milky juice, found growing in the Southern States, flowering from April to July; leaves sessile, lanceolate, serrulate, coriaceous, alternate, smooth; flowers yellow, small, in dense, catkin-like spikes, of which the upper part is occupied by the male and the lower by the female; calyx two to three cleft; stamens two, rarely three; stigmas three, simple; capsule three-lobed, one-seeded, rough, greenish-brown; root, as found in the shops, one foot long, two inches in diameter above, tapering downward, slightly branched, yellowish-brown, pinkish internally, compact, longitudinally wrinkled, tough, fracture fibrous, bark thick, inner layer and medullary rays dotted with many brownish-yellow resin cells; odor of fresh root unpleasant; taste bitter, with persistent, pungent acidity in the throat. The root should be tinctured when fresh, as it loses its medicinal properties when dried. Solvents, alcohol, water. Dose, from fifteen to thirty grains.

CONSTITUENTS—An acrid resin, volatile oil, stillingine, tannin, starch, gum.

PREPARATIONS—*Extractum Stillingiæ Fluidum*. Fluid Extract of *Stillingia*. Dose, from ten to sixty minims. Specific *Stillingia*. Dose, from one to sixty minims. *Linimentum*

Stillingiæ Compositum, A. D., Syrupus Stillingiæ Compositus, A. D., Oleum Stillingiæ, A. D.

Specific Symptomatology—Irritation of the mucous membranes of the bronchial tubes, larynx, throat and both nasal cavities, deficient secretion, membranes red and tumid or glistening, blood dyscrasia with general enfeeblement, skin diseases of a moist character, red and irritable.

Therapy—The application of this substance to the chest with the internal use of small doses of the tincture will be found of great benefit in **bronchial cough** where there is a sensation of tightness in the chest, where the cough is hoarse and croupal without secretion. It has long been used in conjunction with lobelia in the treatment of **croup**.

As an alterative it has taken front rank with Eclectics for fifty years. It is in general use in **syphilis**, in **scrofula**, in blood taint of any character, in **tubercular disease**, and in the **cancerous diathesis**.

CORYDALIS.

CORYDALIS FORMOSA.

Synonyms—Turkey corn, squirrel corn.

Part Employed—The root.

Natural Order—Fumariaceæ.

Locality—United States.

Botanical Description—Turkey corn is an indigenous, perennial plant with a tuberous root, growing in rich soil and flowering early in the spring, in some sections as early as March; leaves radical, ten to fifteen inches high, biternate, glaucous; leaflets linear-oblong, pinnatifid; scape naked, eight to ten inches high, with four to eight cymes, each with six to ten greenish-white flowers tinged with purple; capsule pod-shaped, many seeded. The thin, subterranean shoots bear tubers which are collected for medicinal purposes. They are about one-fourth inch in diameter, of a dark-yellow color, smooth, scarred on the depressed sides, internally yellowish; break with a mealy fracture; taste bitter. Solvents, alcohol, water. Dose, from ten to thirty grains.

CONSTITUENTS—Corydalin, fumaric acid, bitter extractive, acrid resin, starch, volatile oil.

PREPARATIONS—Corydalia (hydro-alcoholic extract). Dose, from one-half to one grain.

Extractum Corydalis Fluidum, Fluid Extract of Corydalis. Dose, from half a dram to one dram.

Specific Corydalis. Dose, from five to forty minims.

Physiological Action—In overdoses it has produced biliousness, deranged stomach, an excessive secretion of mucus, or catarrh of the stomach and intestinal canal, loss of appetite,

indigestion, fetid breath, irregular bowels and colic, with malaise and general indisposition to exertion.

This agent was in great repute among very many of our older physicians as an alterative of special value. Tonic properties are so evident in it that the patient's vitality is increased while the metabolism of the system is influenced. In this particular it will operate in harmony with *echinacea*. It is co-operative, also, with *berberis*, *hydrastis*, *xanthoxylum* and *stillingia*. In syphilis, scrofula, and in all glandular derangements with general depravity of the system, marked blood dyscrasia and general impairment of the nutritive functions, this agent is indicated.

Its influences are demanded in these cases more especially if there be tumidity and enlargement or distension of the abdominal structures with general atonicity, or in some cases in which there are persistently coated tongue and fetid breath. This is often the condition in which a patient is found following a protracted attack of intermittent fever-ague, and since the entire glandular system has become sluggish from the disease the tonic effects of this agent are here indicated. Its influence can be greatly heightened by the direct nerve tonics and calisaya, in such cases as these.

Therapy—When blood **dyscrasia** is present, sluggishness of the digestive apparatus, deficient glandular secretion, impaired secretion of the mucous membranes of the stomach and intestinal canal, this agent is indicated, as, in these cases, its tonic properties are plainly manifested.

It is of value in imperfect restoration of these functions after protracted disease, on which it operates with the tonic and restorative stimulants to an excellent advantage.

Amenorrhœa, **leucorrhœa** and **dysmenorrhœa**, with relaxed condition of the uterine supports and prolapsus, sometimes occurring from the extreme debility following severe fevers, and common, also, with scrofula and other blood dyscrasias, are all materially benefited by *corydalis formosa*.

In chronic **skin disorders** with marked cachexia, this agent is speedily curative. It will be found superior to other agents in overcoming eczema with great relaxation of tissue and general plethora.

It has been used in all stages of **syphilis** and **scrofula** with marked results. In syphilitic nodules of the bones, in syphilitic and scrofulous ulcerations, its influence is direct, immediate and permanent. If there is persistent ulceration with general breaking down of soft tissue, a strong infusion has been applied externally with good results. This is in part due to its stimulating influence upon the emunctories of the skin, facilitating elimination through the glands of this structure.

It has a marked influence, also, upon the kidney function, which, while beneficial in its direct influence upon general

elimination, is hardly sufficient to enable it to be depended upon as curative of kidney or bladder troubles to the exclusion of the use of more direct agents.

CHIMAPHILA.

Synonym—Pipsissewa.

Part Employed—The whole plant.

Natural Order—Ericaceæ.

Locality—North America, Europe.

Botanical Description—*Chimaphila Umbellata* is a creeping, evergreen, perennial shrub, four to eight inches high, bearing the leaves in a whorl at the summit of the stem, and flowering in June and July; the rhizome is yellowish, from which spring several simple, angular stems marked with scars of former leaves, woody at the base, herbaceous above; leaves one to two inches long, short petioled, cuneate-lanceolate, sharply serrate above, base entire, coriaceous, upper side dark-green, glossy, paler beneath; flowers disposed in a corymbose umbel, light-purple, fragrant, and standing on nodding peduncles; taste astringent, bitter. Solvents, alcohol, water. Dose, from fifteen to sixty grains.

CONSTITUENTS—Chimaphilin, arbutin, ericalin, ursone, tannin, sugar, gum, resin.

PREPARATIONS—*Extractum Chimaphilæ Fluidum*, Fluid Extract of *Chimaphila*. Dose, from a half to two drams.

Specific Chimaphila. Dose, from five to sixty minims.

Syrupus Stillingiæ Compositus, Compound Syrup of *Stillingia*. Dose, from one dram to one ounce.

Physiological Action—*Chimaphila* is an alterative, stimulating waste, a tonic giving strength to the body, and a diuretic, removing dropsical accumulations. While it aids in restoring the excretory functions to a normal condition, it tends to remove irritation of the urinary tract and kidneys, lesions of the skin and lymphatic glands, and deterioration of the blood, caused by the presence of waste products, the result of defective catabolism.

Therapy—In the uric acid diathesis, in **dropsy**, with debility and loss of appetite, with **swollen**, inflamed and ulcerated cervical **glands**, enlargement of the parotid glands from retained excrementitious products, dropsy after scarlatina and measles, dropsy with debility from any cause, **chronic rheumatism**, skin diseases with enlarged cervical glands in scrofulous subjects, hectic fever with night sweats, enlargement of the mesenteric glands, secondary syphilis, lithæmia, scanty urine, hæmaturia, gravel, gout, excess of uric acid, brick-dust sediment in the urine, suppression of urine, dropsy from disease of the kidneys,

albuminuria, Bright's disease, chronic catarrh of the bladder, inflamed and swollen prostate gland, with discharge of prostatic fluid, urine thick, ropy, with bloody sediment, itching and pain in the urethra and bladder, strangury, chronic gonorrhœa, chronic nephritis, urethritis with profuse and purulent discharge, obstinate and ill-conditioned ulcers, in latter stages of typhoid fever with deficient excretion, tumors of the mammæ supposed to be cancerous, this agent is used.

In dropsy associated with debility and enlarged glands it should be given freely.

In acute rheumatism a warm infusion should be given till it produces perspiration, while hot fomentations of the same should be applied to the swollen and painful joints.

In obstinate skin diseases in scrofulous subjects, the tincture from the fresh leaves should be applied to the diseased skin and taken internally.

LAPPA.

ARCTIUM LAPPA.

Synonym—Burdock.

Part Employed—The root and seed.

Natural Order—Compositæ.

Locality—North Asia, Europe, North America.

Botanical Description—There are three varieties of *Arctium*—*lappa major*, *lappa minor*, and *lappa tomentosa*—the first being officinal. Burdock is a biennial plant, growing freely in waste places and along roadsides throughout the country; stem erect, branched, three to four feet high, succulent, pubescent, round, furrowed; leaves large, alternate, cordate, oblong, petiolate, denticulate, green above, downy beneath, veined; flowers purple, globose, arranged in terminal panicles, calyx consists of imbricated scales, with hooked extremities forming a bur which easily attaches to clothing and similar objects; akenes flattened, pappus with numerous short hairs; seeds quadrangular; root fusiform, a foot or more in length, brown externally, inside white, fleshy when recent, losing four-fifths of its weight in drying, crowned with a tuft of white, hairy leaf-stalks; bark thick, inner part and wood radially striate, parenchyma free from starch; odor unpleasant; taste sweetish, bitter, mucilaginous; should be collected in the spring when a year old. Solvents, alcohol, water partially. Dose, from a half to two drams.

CONSTITUENTS—Inulin, mucilage, sugar, resin, tannin, glucoside, fixed oil, wax.

PREPARATIONS—*Extractum Lappæ Fluidum*. Fluid Extract of Lappa. Dose, from a half to one dram. *Specific Lappa*. Dose, from five to thirty drops.

Therapy—This agent closely resembles yellow dock in its action as an alterative; it has a direct influence upon the blood, and thence upon diseases of the skin and mucous membranes. Its influence upon the mucous membranes of the stomach encourages normal glandular secretion and promotes digestion. In **aphthous ulcerations** of these membranes and in catarrhal ulcerations, it is excellent.

It influences the mucous membranes of the air passages when irritated from any blood disorder, alleviating **irritable coughs**.

It cures **psoriasis** and obstinate **chronic cutaneous eruptions**.

It has a marked influence upon **chronic glandular enlargements**, and is beneficial in **syphilitic, scrofulous** and **gouty** conditions.

It relieves **irritation** of the **urinary apparatus**, promoting a free flow of the urine containing urea, uric acid, and a full quantity of excrete solids.

RUMEX.

RUMEX CRISPUS.

Synonym—Yellow dock.

Part Employed—The root.

Natural Order—Polygonaceæ.

Locality—Europe, North America.

Botanical Description—The *rumex crispus*, *rumex Britannica*, *rumex obtusifolius*, and *rumex aquaticus*, possess similar medicinal properties, and are the most important. While other allied plants have been used indiscriminately with the above, the first is, perhaps, the only one entitled to a place in our *Materia Medica*.

The yellow dock, which was introduced into this country from Europe, is a perennial plant found growing in cultivated and waste ground, flowering in June and July; stem two or three feet high, angular, furrowed, crooked, smooth; leaves lanceolate, very wavy, curled, green, lower ones truncate at the base, slightly dentate, uppermost narrow, nearly sessile, radical ones on long petioles; flowers numerous, pale green, crowded in whorls on long, wand-like racemes, interspersed with leaves below, mostly grain-bearing; root eight to thirteen inches long, one-fourth to three-fourth inches thick, fusiform, fleshy, many-headed, annulate above, deeply-wrinkled below, reddish-brown externally, whitish internally, with fine, straight, interrupted, reddish medullary rays, and a rather thick bark; fracture short; odor slight, peculiar; taste bitter, astringent. (U. S. P.) Solvents, alcohol, water. Dose, from fifteen to sixty grains.

CONSTITUENTS—Chrysophanic acid, tannin, gum, starch.

The petioles of the leaves contain nearly one per cent of oxalic acid.

PREPARATIONS—Extractum Rumicis Fluidum. Fluid Extract of Rumex. Dose, from ten to sixty minims. Specific Rumex. Dose, from five to thirty minims.

Therapy—The alterative properties of this agent are underestimated. It is a renal depurant and general alterative of much value when ulceration of mucous surfaces or disease of the skin results from impure blood. It acts directly in its restorative influence, purifying the blood, removing morbid material, and quickly cures the diseased conditions. It is valuable in **ulcerative stomatitis**, in **nursing sore mouth**, and in ulceration of the stomach with great lack of tone, combined with quercus or other tonic astringent, it has no equal in these conditions. It has cured exceedingly persistent cases of exhaustive morning diarrhœa, the discharges being very frequent between six and twelve o'clock. It has been used also in the treatment of **syphilis** and **scrofula** with good results.

KALMIA.

KALMIA LATIFOLIA.

Synonym—Mountain laurel.

Part Employed—The leaves.

Natural Order—Ericaceæ.

Locality—United States, Canada.

Botanical Description—Mountain laurel is an evergreen shrub or small tree from six to thirty feet high, with crooked stems and a rough bark, found growing on rocky hills and in damp soil; flowering in June and July; leaves alternate, ternate, green on both sides, smooth, coriaceous, oval-lanceolate, entire, acute at both ends, two or three inches long, petiolate; flowers in dense racemose corymbs, rose-red or whitish, viscid, pubescent; corolla slightly cup-shaped, with two niches in the circumference of the limb in the lower part, in which the ten anthers are lodged until freed by insects, when they shed their pollen; fruit-pod globular, five-celled, five-valved; seeds numerous, minute; taste astringent, bitter. Solvents, alcohol, water. Dose, from ten to thirty grains.

CONSTITUENTS—Andrometoxin, arbutin, tannin.

PREPARATION—Specific Kalmia. Dose, from one-half to five minims.

Physiological Action—In Kalmia we have a remedy acting in a manner somewhat like veratrum viride, both in controlling fevers and in inflammations, as well as in its influence as an alterative, it having been successfully used both in primary and secondary syphilis. Like veratrum it has also been employed

hypodermically in the treatment of neuralgia of the face, and sciatica.

Therapy—Professor John King reports the following case: "Some time since I treated a case of **syphilis** of five weeks' standing, which had not received any kind of treatment during that period. The patient at the time I saw him had several chancres; the surface of the body and head was covered with small red pimples, elevated above a jaundiced skin, and he was in a very debilitated condition. I administered a saturated tincture of the leaves of *Kalmia*, and touched the chancre with tincture of muriate of iron, and effected a cure in four weeks, removing the jaundice at the same time."

Notwithstanding the authority, we accept this statement, *cum grano salis*. If *Kalmia* would relieve other cases of syphilis as it did this one, we may safely say that we have no other alterative in our materia medica equal to it. It has not been extensively used, but it is without doubt beneficial in **glandular disorders**, in **scrofula**, and in mild cases of secondary syphilis.

It will be found of service in inflammatory diseases, **hypertrophy of the heart** with **palpitation**, **diarrhœa** and **dysentery**, **rheumatism**, chronic inflammations, with atonicity, neuralgia, active hemorrhages, threatened abortion from syphilitic taint, active **menorrhagia**, pain in the limbs and back during menstruation, jaundice, and also in scleritis, with pain in turning the eyes, and in ophthalmia.

BLADDER WRACK.

FUCUS VESICULOSUS.

Synonyms—Sea wrack, Kelp-ware.

Part Employed—The plant.

Natural Order—Oosporeæ.

Location—Rocky seashore of the Northern Hemisphere.

Botanical Description—A sea-weed growing along rocky coasts. It was originally gathered, dried and burned, and from the ashes, the sodium hydrate and other salts were dissolved and precipitated. Iodine is yet obtained by this process to but a small extent, although present in large quantities.

The branching of fucus is dichotomous, and the further development is often beautifully bifurcate, sometimes sympodial. The ramifications lie all in one plane, having only some later displacements. Portions of the tissue not infrequently separate from one another in the interior of the thallus, and thus form cavities that are filled with air; these project as bladders on the outer surface, and serve as floating apparatus for the thallus, which is fixed at its base. The fronds are dioecious, six inches to three feet long, stipulate, midrib distinct throughout, margin

entire, often wavy; bladders spherical or slightly elongated, usually in pairs.

PREPARATIONS—Fluid Extract Bladder Wrack, miscible with water without precipitation. Dose, from one-half to four drams, three times a day.

Powdered Extract Bladder Wrack, of the same strength as the solid extract. Dose, from five to thirty grains.

Solid Extract Bladder Wrack; one part equals five of the plant. Dose, from five to thirty grains.

Therapy—This agent is used for the specific purpose of **reducing unhealthy fat** in excessive adiposity. If given in doses of from one-half to two drams, three or four times daily, it has reduced excessively fat patients in a satisfactory manner without interfering in any way with the normal health functions. Wilhite, in *New Preparations*, 1878, gave his observations as follows: "From our study of the drug we do not believe fucus to be a reducer of the adipose tissue of *healthy subjects*. It is mostly on those cold, torpid individuals with a cold, clammy skin, loose and flabby rolls of fat, with relaxed pendulous abdomen, that fucus will display its powers to the best advantage. In this class of cases fat is a morbid condition, a result of vitiated function. With such the remedy acts beneficially by overcoming this torpid and morbid tendency, thus reducing the size by toning up the vascular and sympathetic systems. Possibly it also acts upon the starchy matters of the food in some manner, so as to prevent their easy change into fat when introduced into the human economy."

It is in the **obesity** of individuals of the lymphatic temperament that the beneficial effects of this drug are most marked. It has little or no influence in the reduction of the fleshiness of persons of active habits, or of those of the sanguine temperament. In these cases strict regulation of the diet affords the only prospects of relief, but owing to the keenness of the appetite usually present, this regulation is rarely enforced. Fucus shows its most decided influence upon women in whom there exist menstrual derangements, as menorrhagia and leucorrhœa, owing to a general atonic and flabby condition of the uterine tissues. In such cases an improvement in the local derangements usually precedes the general reduction of fat and the improved tonicity of the general system.

Fucus is advised as a specific remedy in the treatment of both **exophthalmic** and **simple goitre**. It is especially successful in patients not above thirty years of age. It is also suggested in the treatment of **fatty degeneration of the heart**. It is of service in **desquamative nephritis**, and in irritation and **inflammation of the bladder**. When general muscular relaxation is present, it is of service in the treatment of **menstrual derangements**.

ICHTHYOL.

Synonym—Ammonium Sulpho-Ichthyolate.

Occurrence—This substance is of peculiar origin. There is found in the Tyrol mountains a deposit of fossil fish in bituminous rock. From the destructive distillation of this substance a crude oil is obtained. This oil is treated with sulphuric acid, and then with sodium hydrate and subsequently with ammonia.

Description—It is a reddish-brown, thick, tarry and syrupy liquid with a disagreeable odor and taste. From five to twenty grains per day is the dose. It is soluble in water.

Therapy—The specific influence of the agent has not been determined. It is an alterative agent for both external and internal use.

Hare recommends it highly in the treatment of **acute articular rheumatism**. He applies an ointment to the inflamed area, which contains two drams of ichthyol and twenty drops of the oil of citronella to an ounce of adeps. This is applicable in severe sprains of the joints, and injuries of that character. The agent is widely used, also, in **chronic rheumatism** and in **gouty conditions**.

This same ointment is applied to **erysipelas** with equally good results in all cases.

In **lymphatic indurations** and chronic **scrofulous enlargements** it is a serviceable application; also in other glandular conditions with chronic enlargement. It is used extensively in the treatment of **skin diseases**,—ulcers of various kinds, urticaria, acne, intertrigo, **eczema** and **psoriasis**. It has been extolled in **lupus**, in **epithelioma** and in **keloid** also.

It is used to good advantage in chilblains, frost bites, burns, contusions, and in slowly healing wounds.

A foreign physician employed ichthyol in eighteen cases of **variola**, only two of which were fatal. From the time the papules appeared until the pustules disappeared, a pomade was applied, made of one part of ichthyol to two parts of lanolin, and six parts of the oil of sweet almonds. The results were highly satisfactory.

COLCHICUM.

COLCHICUM AUTUMNALE.

Synonym—Meadow saffron.

Part Employed—The bulb and seeds.

Natural Order—Liliaceæ.

Locality—Europe.

Botanical Description—Colchicum grows in meadows and pastures in central and southern Europe, flowering in September and October, the seeds ripening in June following. Its

development covers a period of two years. In the latter part of summer a new bulb springs from the lower part of the old one, the latter embracing it half round. The new plant sends out fibers from its base, and has a tubular, cylindrical spathe open at the top on one side and half under ground. In September two to six purple flowers emerge from the spathe, but no leaves; the tube of the corolla is five inches long, the limb consisting of five segments, the flower tube being two-thirds under ground. The fruit remains under ground till the following spring, when it rises on a stem above the ground as a three-lobed, three-celled capsule.

The leaves follow the flower and are radical, lanceolate, about five inches long and one inch to two inches wide. As the new bulb grows the old one passes away, and when the new one matures it gives off new bulbs, which in turn mature at the expense of the old one.

The bulb should be gathered in June of the second year's growth, before its powers are exhausted by furnishing nourishment to the new bulb.

The seeds, which should be gathered in August, are rough, one-twelfth inch thick, roundish, dark-brown, pointed at the hilum, very hard, tough.

Both the seeds and the bulb have a bitter, acrid taste. Solvents, alcohol, vinegar, wine.

It is extremely difficult to dry the bulb and not destroy its medicinal properties, therefore a tincture should be made while it is fresh.

Dose of the bulb, from two to eight grains; of the seed, from one to five grains.

CONSTITUENTS—Colchicine, Colchicoresin, Beta-colchicoresin.

PREPARATIONS—Specific Colchicum Dose, from one-fourth grain to three grains. Extractum Colchici Seminis Fluidum. Fluid Extract of Colchicum Seed. Dose, from one to five minims. Vinum Colchici Radicis. Wine of Colchicum Root (when made from the fresh bulb). Dose, from one to five minims. It should be discontinued as soon as violent catharsis or any depressing effects are observed.

Physiological Action—Moderate doses cause some gastrointestinal irritation, with loss of appetite, colic and diarrhoea; if the quantity is increased there is bilious vomiting, irritation of the colon with colicky pains, bloody and mucous stools, but without tenderness on pressure over the abdomen; while poisonous doses cause violent gastro-intestinal irritation, griping, purging, vomiting, painful spasms of the limbs and trunk, collapse, delirium, coma and death.

A cathartic and depressant of vital action in large doses, an irritant poison inducing the phenomena of acute cholera, with great enfeeblement of the heart's action and of the circulation.

Therapy—It is seldom used for its cathartic influence but has long been given as a magical eliminative in **chronic rheumatism** and **gout**. It has a specific influence upon muscular pains, acting in harmony with *cimicifuga*, with which it is usually prescribed, and with *gelsemium*. It must be given always short of its cathartic action; even then, when continued for some time, it depresses the heart and the nervous system, producing a feeble pulse and cool skin. It is seldom given in acute rheumatism, although it may be prescribed advantageously in these cases.

In **rheumatic carditis** or **pericarditis** in its sthenic stage, its influence is sometimes superior to that of any other agent. Its direct influence on the disease processes is exercised to a most desirable extent.

GAULTHERIA.

GAULTHERIA PROCUMBENS.

Synonym—Wintergreen.

Part Employed—The leaves.

Natural Order—Ericaceæ.

Locality—United States.

Botanical Description—*Gaultheria procumbens* is an evergreen creeping plant, growing in damp woods and in sandy soil, from Canada to Florida, flowering from June to October; root horizontal, spreading by long, mostly subterranean, runners; stem slender, ascending, round, three to five inches high; leaves crowded at the top of the stem, obovate, alternate, green, mucronate, coriaceous, with a few short serratures, each terminating in a bristle; flowers few, white, drooping, axillary, on round, downy stalks; corolla white, small, urn-shaped, contracted at the mouth, divided at the border into five acute segments; calyx composed of five rounded, acute segments; stamens ten; filaments white, hairy; anthers oblong; ovary roundish, depressed; style erect; stigma simple; fruit a bright red berry, five-seeded, spicy, edible. Solvent, alcohol. Dose, from ten to twenty grains.

CONSTITUENTS—Volatile oil, tannin, gallic acid, arbutin, urson, ericolin, sugar, gum.

Oil of Gaultheria (*Oleum Gaultheriæ*)—This oil is prepared by distilling wintergreen leaves while fresh with water or steam. It is transparent and colorless when recent, but soon becomes reddish from exposure. It has an aromatic odor and a strong, spicy, agreeable taste. Pure oil of wintergreen contains about 90 per cent. of methylsalicylic acid. The dose of the oil is five or ten drops, repeated every two or three hours, till some effect is produced, favorable or otherwise. If ringing in the ears is caused by the medicine, it should be discontinued or repeated in

smaller doses when this effect has passed off. The remedy in full doses is apt to cause dangerous depression in debilitated constitutions.

Salicylic acid, made from oil of wintergreen, is the only preparation of the acid suitable for internal use.

A pure salicylate of soda is made from the salicylic acid of oil of wintergreen, which is preferred in the treatment of acute articular rheumatism; while in neuralgia of the fifth cerebral nerve, tic douloureux, and gonorrhœal rheumatism, the oil of wintergreen, in as large doses as can be borne, is the better treatment. In other cases, a tincture of the fresh plant should be employed.

It may be employed as a spray to the throat in diphtheria; and suitably diluted, as a dressing for wounds; while it may be used internally for the general purposes of an antiseptic.

PREPARATIONS—Specific Gaultheria. Dose, from five to thirty minims.

Specific Symptomatology—The agent is given successfully in the treatment of **hemorrhoids** from congestion of the pelvic circulation, hemorrhoids with very painful external tumors, of a dark-purple color, with constipation, with pain across the sacrum, and congestion of the portal circulation.

Therapy—It is of benefit in **neuralgia**, **tic douloureux**, **gonorrhœal rheumatism**, **inflammation** of the **bladder**, irritation of the prostate gland, **dysuria**, sexual excitement in male or female, **spermatorrhea** without impotency, **acute articular rheumatism**, **migraine**, **sciatica**, diabetes, **diphtheria**, chronic mucous discharges and toothache (locally). A liniment of the oil is useful in allaying the pain of rheumatism.

Asthmatic breathing of a non-paroxysmal character is relieved by this remedy, as is **asthmatic cough**, and cough characterized by constriction or tightness at the supra-sternal notch. In the cough of asthmatic **bronchitis**, or in dry, harsh, persistent bronchial or phthisical cough, this agent acts nicely.

It is a serviceable remedy in **hepatic congestion**, and in congestion of the glandular structures of the entire gastro-intestinal tract. Its influence over the portal circulation is most pronounced.

In ovarian conditions inducing too frequent menstruation, with congestion of the pelvic circulation, in addition to the conditions above named, as in enlargement of the uterus, with a swollen, engorged condition of the cervix, it is directly useful.

TRIFOLIUM.**TRIFOLIUM PRATENSE.**

Synonym—Red clover.

Part Employed—The blossoms.

Natural Order—Leguminosæ.

Locality—United States.

Botanical Description—Red clover is a biennial plant, extensively cultivated in grass lands, or alone, in the United States, flowering throughout the summer; stems several in number, springing from the same root, ascending, pubescent, slender; leaves ternate; leaflets obovate, entire, nearly smooth, often notched at the end, with a pale spot on the face; flowers red, in short, dense, ovate, sessile heads, the head closely surrounded by the uppermost leaves; odor fragrant. Solvents, alcohol, water. Dose, from five to fifteen grains.

CONSTITUENTS—Not analyzed.

PREPARATIONS—Specific Trifolium. Dose, from one to sixty minims.

Therapy—Trifolium has been used as a **cancer** remedy by virtue of specific alterative properties said to exist in it. It was at one time widely advertised, but the profession has failed to observe the effects claimed by the proprietors, and yet it undoubtedly has active alterative properties. It is given where a cancerous diathesis is known to be present, and its use is persisted in for months. Improvement in objective phenomena is reported from a number of excellent observers.

The agent is also prescribed in **irritable conditions of the larynx** and air passages, especially if evidenced by **spasmodic cough**. It has served a good purpose in **whooping cough**, in the **cough of measles**, and in general bronchial or pulmonary irritation. A dry, irritable cough will respond most readily to its influence.

SENEGA.**POLYGALA SENECA.**

Synonym—Seneca snakeroot.

Part Employed—The root.

Natural Order—Polygalaceæ.

Locality—United States.

Natural Description—Polygala Senega is a perennial herb, growing in rocky woods, and flowering in July; stems several, annual, erect, simple, smooth, eight to fourteen inches high, occasionally reddish or purplish below, green above; leaves alternate, sessile, lanceolate, one to two inches long, half an inch wide, margin rough, bright green, smooth; flowers white, subsessile, on slender terminal spikes; calyx showy; sepals five, two large, wing-shaped, white; three small, green; corolla small, closed; capsule small, obcordate, two-celled, compressed, two-

seeded; seeds two, oblong-ovate, hairy, blackish; root firm, hard, branching; when dried is in pieces about four inches long, with thick, knotty head, with traces of numerous stems, with spreading, tortuous branches, and a projecting ridge which runs round the root from top to bottom; yellowish-gray or brownish-yellow externally, whitish internally: bark thick, white; wood porous, yellow; odor slight; taste sweetish, acid. Solvents, alcohol, water. Dose, from five to twenty grains.

CONSTITUENTS—Polygalic acid, polygalin, fixed oil, resin, volatile oil, sugar, malates.

PREPARATIONS—*Extractum Senegæ Fluidum*, Fluid Extract of Senega. Dose, from ten to twenty minims.. *Specific Senega*. Dose, from one to twenty minims.

Physiological Action—Senega has sustained a reputation in the past, as an antidote to the poison of venomous reptiles. It is an alterative of much power, exercising a marked influence upon both the skin and mucous membranes, notably the latter. In large doses it produces nausea, vomiting and catharsis.

It causes a sensation of acidity in the throat when a moderate dose is swallowed, and may be employed in chronic pharyngitis, as a local stimulant, where the mucous membrane is relaxed and the secretion abundant.

Specific Symptomatology—The agent is indicated in **typhoid pneumontis**, capillary bronchitis, in aged and debilitated subjects, chronic bronchitis with profuse secretion, in the declining stages of pneumontis, bronchitis and croup, when the inflammatory condition has passed off, chronic bronchitis with pain and soreness in the chest and asthma.

Therapy—The agent is in use in the treatment of **dropsy** from obstruction and glandular enlargement, also in **rheumatism**, **syphilis**, **squamous skin diseases** and in **amenorrhœa**. In inflammation of the eyelids, and iritis it is beneficial.

Senega has been employed as a stimulating expectorant in **chronic bronchitis**, in aged and debilitated subjects, where a stimulating medicine is demanded, and in the later stages of pneumonia and catarrhal inflammations.

In these cases, given in small doses, it improves secretion, removes abnormal deposits and restores the strength.

It is an energetic stimulant of the mucous membranes of the air passages; and, when given before the inflammation has subsided, aggravates the cough and does harm. Given in small doses, it also acts as an alterative, and may thus be given in dropsy from obstruction, in **syphilis**, and in squamous skin diseases.

In the latter class of diseases, it is one of our most efficient remedies.

CHAPTER III.

HAMAMELIS.
CALENDULA.
ÆSCULUS.
TRIFOLIUM.
SENEGA.

COLCHICUM.
GAULTHERIA.
SALICYLIC ACID.
SALOL.
SALOPHEN.

HAMAMELIS.

Synonym—Witch-hazel.

Part Employed—The bark and leaves collected in autumn.

Natural Order—Hamamelaceæ.

Locality—United States.

Botanical Description—Hamamelis Virginica is an indigenous woody shrub, growing in all sections of the United States and Canada; stem crooked, with flexuose branches, from four to six inches in diameter and ten to twelve feet high; wood white; bark smooth, brown, or brownish-gray when old, fissured; leaves alternate on short petioles, four to six inches long, two to three inches wide, obovate, cordate, acuminate, wavy-toothed on the margin, scabrous, with minute elevated spots beneath; flowers yellow, in little axillary clusters, surrounded by a three-leaved involucre; calyx small, four-parted, with two or three bracts at its base; petals four, yellow, three-fourths of an inch long, twisted, appear in September and October; stamens, four sterile ones opposite the pistils, alternating with four fertile ones; styles two, short; pod nut-like, two-celled, two-beaked, dehiscing loculicidally; seeds black, oily, edible; bark and leaves bitter, astringent. Solvents, water, dilute alcohol. Dose, from one-half to one dram.

CONSTITUENTS—Tannin, volatile oil, a bitter principle.

PREPARATIONS—Extractum Hamamelis Fluidum, Fluid Extract of Hamamelis. Dose, from ten to sixty minims.

Distilled Extract of Hamamelis. Dose, from ten to sixty minims.

Specific Hamamelis. Dose, from five to sixty minims.

Specific Symptomatology—Soreness of muscles, muscular aching, a bruised sensation, soreness from violent muscular exertion, soreness from bruises and strains, soreness and muscular aching from cold and exposure, relaxed mucous membranes, dark blue membranes from venous stasis, veins dilated, relaxed, enlarged, and full—varicosis.

Therapy—Internally it is given with the above indications as a remedy for **sore throat** of whatever kind, with feeling of extreme soreness, and with dark-colored membranes.

It is used in **tonsillitis** and **diphtheria**, in **phlegmonous ulcerations** of the mouth and throat, and in **acute catarrh**. If

HAMAMELIS VIRGINICA.

there is **hemorrhage** from the post-nasal cavity, or from the teeth, or from spongy gums, it is a useful remedy.

It is valuable when there is excessive **catarrhal discharge** from dark, relaxed mucous membranes, and in catarrhal or watery **diarrhœa** with a tendency to passive hemorrhage of dark blood.

It has conspicuous virtue in the treatment of **hemorrhoids** with the specific indications. The fluid extract in fifteen drop doses every two hours will quickly effect a cure in recent cases, and will greatly benefit chronic cases, its influence being greatly enhanced if combined with Collinsonia. In relaxation of the mucous membranes of the rectum and in **prolapse of the bowel**, it is useful. In these cases the distilled extract should be applied externally while the fluid extract is given internally.

It is a good remedy in relaxation of the vaginal walls with **leucorrhœa**, and in **catarrh of the womb**, also in passive hemorrhages from these parts, especially if there be soreness or extreme tenderness. Externally the distilled extract is of first importance in soreness of the muscles, or aching of parts. In bruises, sprains and muscular lameness its application gives prompt relief. If applied hot it is particularly effectual. In the general aching, lameness, and muscular soreness, following a **severe confinement**—a source of extreme discomfort, often greatly retarding recovery—this agent applied hot will give immediate relief, a measure it is cruel to neglect to advise, in these cases, as it acts at once. In lame and **sore breasts** it may be applied, to immediately relieve the soreness, but other remedies should be given for acute inflammatory action.

Its indications would suggest it as an excellent remedy in **rheumatism**, being of value externally and in conjunction with other remedies.

Applied to **burns** and **scalds** it gives prompt relief. Ten grains of Menthol dissolved in four ounces of the distilled extract applied to a burn will stop the pain at once and will promote the healing. It is best applied by saturating a soft cloth with which the burned surface may be covered.

CALENDULA.

CALENDULA OFFICINALIS.

Synonym—Marigold.

Part Employed—The leaves and flowers.

Natural Order—Compositæ.

Locality—Southern Europe, Levant.

Botanical Description—The garden marigold is an annual plant, frequently cultivated for ornament; stem rough, hairy, angular, spreading, striated, green, one to two feet high; leaves alternate, acute, oblanceolate, sessile, fleshy, toothed, lower

ones spatulate, rough, ciliate flower-head large, terminal, solitary, yellow, two inches broad, ray florets two-rowed, disk florets tubular; ray florets half an inch long, one-fourth inch wide, strap-shaped, linear, tridentate; odor unpleasant, heavy, narcotic; taste bitter, saline. Solvent, alcohol. Dose, from five to sixty grains.

CONSTITUENTS—Calendula, volatile oil, amorphous bitter principle, gum, sugar.

PREPARATIONS—Tinctura Calendulæ, Tincture of Calendula. Dose, from half a dram to one dram. Specific Calendula. Dose, from one to sixty minims.

Therapy—This agent is used principally for its local influence. Internally it is given to assist its local action, and to prevent suppuration in cases where there is a chronic tendency to such action. It is useful in varicose veins, chronic ulcers, capillary engorgement, and in hepatic and splenic congestion.

As arnica is applied to bruises and sprains, this agent is also applicable; and in addition it is of much service applied to **recent wounds, cuts and open sores**. It is antiseptic, preventing the formation of pus. It causes the scar, or **cicatrix**, to form without contraction of tissues, and in the simplest possible manner. It hastens the healing of wounds and materially favors union of co-adapted surfaces by *first intention*. It relieves the pain in **wounds**, and if there are bad bruises, it quickly relieves the soreness and favors the healing process.

It is applicable to catarrhal mucous surfaces, to festering sores, local swellings, glandular inflammations and to epithelioma and carcinoma to correct the fetor. It is especially applicable to **severe burns**, to promote healing and to prevent the formation of a contracting scar.

ÆSCULUS.

ÆSCULUS GLABRA.

Synonym—Buckeye.

Part Employed—The seeds.

Natural Order—Sapindaceæ.

Locality—United States.

Botanical Description—The Ohio buckeye is a large tree, common in the western states; leaves opposite, palmate; leaflets fine, nearly smooth, straight-veined, serrate, oblong-lanceolate, acute; flowers arranged in a short panicle; stamens longer than the petals; petals pale-yellow; fruit prickly, roughened; taste bitter. Solvent, alcohol. Dose from one to fifteen grains.

CONSTITUENTS—A poisonous principle acting like nux vomica.

PREPARATIONS—Specific Æsculus. Dose, from one-tenth of a minim to five minims.

Physiological Action—*Æsculus Glabra* acts on the cerebro-spinal system; and in toxic doses causes vertigo, vomiting, wry-neck, opisthotonos, tympanites, stupor, coma and death.

Therapy—*Æsculus Glabra* is a narcotic, but actively stimulates the nervous system somewhat like *nux vomica*. It has a special influence on the capillary circulation of the **rectum**, and on the pelvic and portal circulations and overcomes constipation and congestion associated with **hemorrhoids**, and aids in the absorption of the coagulated blood in hemorrhoidal tumors where a surgical operation is not deemed advisable. It lessens the caliber of the capillary vessels, and removes obstructions to the pelvic circulation, and is applicable whenever congestion results in hemorrhoids, or in enlargement of the uterus.

In paralysis it is a stimulant similar to strychnine. As a narcotic it acts similarly to opium but has much less narcotic power.

ACIDUM SALICYLICUM.

Synonym—Salicylic Acid.

Occurrence—Salicylic Acid occurs in nature combined with the methyl radical in the form of methyl salicylate in many of the essential oils, and more especially in the oil of winter-green which contains ninety per cent of the methyl compound.

It is also obtained synthetically from phenol—carbolic acid, by the action of caustic soda and carbonic acid gas. The process is complex and need not be described. By recent processes its manufacture is so improved that it forms a very perfect substitute, chemically speaking, for the natural acid, but no chemical processes will create the vital influence imparted in the processes of plant growth to the organized Salicylic Acid. The synthetic acid is organic by scientific classification, but not a vital organized product by nature's processes.

The influence of the natural acid is so greatly superior to that of the synthetic acid that it has come into general use by those practitioners who demand perfect remedies for the accomplishment of perfect results.

Description—Salicylic Acid from the oil of *Gaultheria* occurs in the form of minute crystals, slightly tinted with the odor of the oil from which it is obtained, and of a sweetish taste. The synthetic acid occurs in the form of snow-white crystals without odor, of a slightly sweetish afterward acrid taste, irritating to the mucous membranes of the fauces and nasal cavity and causing an increased flow of saliva. It is soluble in 450 parts of cold water and in fourteen parts of boiling water, in two parts of absolute alcohol or ether, and in eighty parts of chloroform. Dose, from three to ten grains.

Physiological Action—Taken into the system, Salicylic Acid produces a roaring in the head similar to that produced by quinine, an uncomfortable fullness of the head, a sensation of distension with deafness and impaired vision. There is trembling or muscular uncertainty, and reduction of reflex action.

From over-doses, Bartholow says strabismus or ptosis may occur, and complete amaurosis has been temporarily induced. It has induced delirium, restlessness, difficult breathing, feeble pulse, loss of control of the natural evacuations. It induces general depression of the functions of the central nervous system. It depresses the action of the heart, and the temperature in large doses, to the extent in health of more than one and one-half degrees. In elevated temperatures its influence is more conspicuous, but if the synthetic agent is used its influence is irregular and not to be relied upon. It is destructive of the red blood corpuscles, destroying their oxygen carrying power. It produces flushing of the face in its first influence, a suffusion of the eyes and sweating which continues even if the temperature falls. Its protracted use produces pallor and prostration with lowering of the vital forces.

The agent is eliminated by all the natural emunctories, the natural form much more freely than the synthetic acid. It has appeared in the urine in fifteen minutes after its ingestion. It is usually, however, slow of absorption and its elimination is correspondingly protracted.

The influence of the agent upon the kidneys must be watched, as it sometimes acts as an irritant, producing congestion and hæmaturia, with partial suppression, or slight albuminuria.

In examining the urine of patients taking Salicylic Acid or its salts, it must be borne in mind that a reaction occurs from their presence with tests for sugar, similar to that of sugar itself, and is often misleading.

Chemical changes occur in the intestinal canal by the action of the digestive and intestinal juices upon it, and the effete products of large doses produce an alteration in the character of the urine.

Salicylic acid is used in medicine largely in combination with the alkaline bases, through its action on the neutral salts of these substances, because of their superior solubility. It was advised when the acid first came into general use, to dissolve it by the addition of the phosphate, acetate, carbonate, or other salt of sodium. This, of course, resulted in the formation of the salicylate of sodium with phosphoric, acetic or carbonic acids as the products. The sodium salt is now more universally used than any other compound of the acid.

The bromides or hydrobromic acid in small doses will correct the unpleasant roaring in the head induced by this acid or by the salicylates, and will permit their protracted use in cases

where, when indicated, the patient is susceptible to this influence.

Therapy—The therapeutic influence of Salicylic Acid in internal use is largely comprehended in the therapeutics of the salicylate of sodium and the other salicylates.

Salicylic Acid is specifically a remedy for **rheumatism**. It is used to best advantage in the acute and sub-acute forms, but will serve an excellent purpose in the chronic forms of whatever character. It is now given in the form of its soluble salts. Relapses are, however, more liable to occur after this agent than after almost any other remedy.

It is advised by Ringer as of especial value in **sciatica** and **lumbago**, and in some cases of **migraine**. It will serve a good purpose in many of these cases.

The antiseptic, deodorant, stimulating and healing properties of the agent are promptly and satisfactorily exhibited. It may be dissolved in hot water and used as a mouth-wash in all conditions of ulceration of the mucous membranes of the mouth or throat. It was commonly used in **diphtheria** at one time, and was superior to other then known remedies.

In **tonsillitis** it seems to exercise a specific influence, operating efficiently in small doses of one or two grains every two hours. It can be applied directly to the tonsils if there is an exudate.

In the form of a spray it is useful in **ozæna** and fetid catarrh. It can be finely pulverized, combined with a non-irritating powder and used as an insufflation, or with a powder blower.

Internally the unaltered acid has been given in the treatment of **ulcerations** and **cancerous** conditions of the **stomach** and of the lungs, in all conditions wherein there was persistent foul breath or offensive expectoration. From two to five grains are given as a dose in these cases. It corrects the bad breath and quiets much of the discomfort present in ulcerative disease of these organs.

It is of value in old indolent **ulcers**, in chronic **tibial ulcers**, in unhealthy granulating sores, and in **cold abscesses**. It is either dusted directly on these sores or incorporated into an ointment, with a healing base.

It is used in **pruritus**, especially if accompanied with a moist discharge from the part, similar to eczema. It is useful in a large number of skin diseases and has been especially advised in some **tubercular** and **epitheliomatous** conditions of the skin.

It is in universal use as a constituent of corn salves and other bunion and **corn** cure remedies, and is useful in the treatment of **chilblains** and frost bites.

Salicylic Acid is an efficient agent in preventing fermentation. It is used to prevent this process in canned fruits, in cider and grape juice, and in other liquids subject to rapid de-

composition. It is useful in preventing decomposition in urine preserved for future observation or analysis.

SALOL.

Synonyms—Phenyl salicylate, Salicylate of phenol.

Occurrence—This agent occurs as a result of the union of salicylic acid and carbolic acid in the presence of the pentachloride of phosphorus.

Description—It occurs in the form of a permanent crystalline powder, white, almost tasteless, but with a faint, aromatic odor. It is feebly soluble in water, but readily soluble in alcohol and chloroform, and in both fixed and volatile oils. This fact renders it useful when it is desirable to combine it with the oils of sandalwood, eucalyptus, turpentine, or copaiba, in the treatment of catarrhal conditions of the bladder or urethra.

Administration—It is prescribed in capsules of from three to six grains every two or three hours. It is safest to discontinue for a few doses, after a number of doses has been given, and to begin again subsequently, if indicated.

Physiological Action—In its physiological action it closely resembles its constituents, salicylic and carbolic acids, as it is clearly proven that the compound is broken up by the action of the pancreatic juice, and these two agents are released in the intestinal canal. This is determined by the presence of the carbolic acid products in the urine, and the evidences of salicylic acid poisoning in the system. A dram of salol will release twenty-four grains of carbolic acid in the system, as forty per cent of the substance is of that acid, and the toxic effects of the agent are the phenomena of salicylic or carbolic acid poisoning.

It is stated by Huselbach, that if the kidneys are diseased, the elimination of the constituents of salol is retarded, and serious poisoning is much more apt to occur. It interferes with the excretory functions of the kidneys, especially if their power is at all impaired. Its use must be avoided entirely if these organs are diseased, and must be administered with careful discrimination in all diseases of the urinary apparatus. In small doses, it is beneficial, if the mucous lining only of the pelvis of the kidney is involved, as in **pyelitis**, but it must not be given in pyelonephritis.

Therapy—Because of the antiseptic character of both the acids, salol is prescribed freely as an **intestinal antiseptic** in all cases, whether of a febrile or non-febrile character, where that influence is desired. It is given in catarrhal and fermentive **diarrhœas**, in **cholera morbus**, and also in **cholera**. It is prescribed in **rheumatism**, where the salicylic acid is indicated,

and the effects are identical with the influences of that agent. The liberation of the acid in the intestinal canal in a form easily absorbed, may facilitate its action.

In **catarrhal cystitis**, with alkaline urine, it is directly serviceable, neutralizing the alkalinity and destroying disease germs.

Its use in **specific urethritis** is quite common, its curative influence depending largely upon its antiseptic properties in all these conditions.

It is prescribed by many physicians as an anodyne and pain-relieving agent. It has but little influence other than in allaying irritation by destroying disease ferments and other causes of painful disorder.

SALOPHEN.

Synonym—Acetylparamidophenyl Salicylate.

Description—This closely resembles salol, containing, however, a less percentage of salicylic acid, and it does not exhibit the carbolic acid phenomena to so great an extent.

Therapy—It is a safer and surer remedy than salol where the effect of salicylic acid in the blood is desired, and it will probably act with much less irritation upon the kidneys. Its influence upon the bladder and mucous membranes of the genito-urinary tract is probably much less active than that of salol.

CHAPTER IV.

LEMON.

CITRIC ACID.

THUJA.

VERBASCUM.

SAXIFRAGE.

MELILOTUS.

SARRACENIA.

CALCIUM SULPHIDE.

LEMON.

Synonym—Lemon Juice.

Part Employed—The recently expressed juice of the ripe fruit of the citrus limonum.

Locality—Tropics and sub-tropics.

Botanical Description—The lemon tree is not above fifteen feet in height, straggling in character, with angular branches and sharp spines in the leaf axils. Bark of the branches green, of the trunk gray; leaves evergreen, two inches long, ovate, acute, serrate, short petioles; flowers form continuously, white to pink in color, pleasant odor; fruit ovoid, two to five inches long, smooth, nipple-shaped extremity, structure like an orange,

LIMONIS SUCCUS.

pulp yellow, sour; seed small; juice yellowish, turbid, strongly acid, one-half to one ounce to each fruit.

Therapy—Because of the citric acid present in this substance it is exceedingly useful in therapeutics. The preservation of this juice from decomposition is easily accomplished by boiling, and pouring it while hot in bottles with narrow necks. The neck of the bottle above the hot juice is filled with sweet oil to the cork, which must fit tightly.

In Italy lemon juice is extensively used in malarial localities as an active **anti-malarial** remedy. It has produced cures in many stubborn cases.

It is an active **anti-scorbutic** and is in common use on ship-board for the prevention or cure of **scurvy**, for which it is of more service than citric acid.

It has been used in some cases of **chronic rheumatism** and gout with good results.

Diluted and sweetened it makes a most refreshing drink in fevers, especially if an acid is indicated, the mouth being dry and parched and the membranes of a dark color. It is useful in the **hoarseness** of singers and speakers to temporarily clear the voice. It will serve a good purpose in irritable dry **coughs**, added to cough syrups.

The pure juice has been injected into the cavity of the womb to control intractable post-partum **hemorrhage**. It is also useful in other hemorrhages.

ACIDUM CITRICUM.

Synonym—Citric acid.

Occurrence—Citric acid is obtained from the juice of the lime, lemon and bergamot. It is present as the acid constituent of the strawberry, raspberry, gooseberry, current and cranberry. It is also present in the tamarind, the red whortleberry, the red elder berry, and in quite a large number of other fruits and plants.

In the process of its manufacture the juice of the fruit from which it is obtained, is boiled and saturated with the carbonate of calcium. It is then treated with sulphuric acid.

Description—It crystallizes in the form of odorless, colorless prisms with a pleasant acid taste. It is deliquescent in cold, moist air, and effervescent in warm, dry air. It is soluble in water, in one and one-half parts of alcohol and in eighteen parts of ether. It is unstable in solution. It is often adulterated with tartaric acid, which is the cheaper of the two, but much more irritating and injurious.

Therapy—This organic acid has a narrow but important field in therapeutics. It is specifically a remedy for **scurvy**. It

is freely used by those who are forced to subsist upon a salt meat diet, or are deprived to a great extent, of vegetable food. Much the same effects can be accomplished by the free use of **lemon juice**, but it cannot be transported often in bulk and is sometimes difficult of preservation. In general scorbutic conditions, the use of citric acid in small quantity extended over considerable time is of much service.

This agent is useful in **rheumatism**. It influences the secretion, excretion, and general elimination of uric acid to a limited extent. It is also useful as a drink in **fevers** in the manner described for mineral acids and tartaric acid. It is cooling, refreshing, allays thirst and stimulates the secretions of the mucous and salivary glands, and temporarily promotes the normal function of the stomach. It is an efficient organic acid with which to supply the demand for acids in conditions where these are deficient.

THUJA.

THUJA OCCIDENTALIS.

Synonyms—Arbor vitæ, white cedar.

Part Employed—The tops.

Natural Order—Coniferae.

Location—Northern United States and Canada, east of the Rocky Mountains.

Botanical Description—The American arbor vitæ is an ever-green tree, indigenous to Canada and to the northern portion of the United States, and found east of the Rockies as far as the Atlantic Coast. It grows from thirty to fifty feet in height, growing in cool, damp, marshy places in cedar swamps; its trunk is seldom straight, and it is branched from the ground up. Its wood is of a light-reddish color, soft, rather fine-grained, brittle, but durable. The leaves are small, closely pressed in four rows, scale-like, an eighth of an inch long, on two-edged, flat, broad branchlets; cones oblong, ovoid, with dry, loose, pointless scales, spreading seeds with broad, marginal wing; two cotyledons; flowers in small, terminal, ovoid catkins, monœcious on different branches; stamens with scale-like filament bearing four anther cells. The odor is pleasantly balsamic with camphoraceous, pungent, bitter taste.

CONSTITUENTS—Colorless, volatile oil, soluble in alcohol, with a sp. gr. 0.92, and a yellow, crystallizable, bitter principle called thujin, punitannic (Kowalier) and thujetic acid.

PREPARATIONS—Extract non-alcoholic, Fluid Extract Arbor Vitæ, not miscible with water.

Dose, from one-fourth to one dram.

Specific Thuja. Dose, from one to ten drops.

Administration—In the treatment of local conditions involving blood changes, the beginning dosage should be small, and administered two or three times per day. If, however, the condition does not show improvement, especially where there is a **cancerous cachexia**, the dose may be increased, if necessary, to one dram every two or three hours. In non-malignant cases the dose may be much smaller. In warts and excrescences, two small doses per day will often remove them in a few days, especially if external use of the agent be made also. In conditions of a syphilitic character the cure in all cases will be more protracted.

Physiological Action—No extended systematic study of the physiological action or specific therapeutic application of this agent has been made. It exercises a peculiar influence over abnormal growths and tissue degenerations, especially those of an epithelial character. It was originally advised as a remedy for epithelioma, to be administered both internally and externally. It has been widely used in the treatment of cacoplastic growths, and glandular indurations of a scrofulous character, also of warts, small tumors, and incipient cancers of different varieties, and goitre. It is a remedy for perverted glandular action and certain blood dyscrasias.

Therapy—It has been used extensively by all physicians in the treatment of **cancer**. It is claimed to exercise an abortive influence over incipient cancer, and to retard the progress of more advanced cases. In extreme cases it will remove the fœtor, retard the growth, and materially prolong the life of the patient. It should be given internally and the dosage increased to the extreme limit. It should also be kept in contact with the parts externally or injected into the structures. **Epithelioma, condylomata**, and all simple cancerous growths should be treated with it.

In the treatment of **urinary disorders**, Thuja serves an important function, particularly in atonic or enfeebled patients. In **nocturnal incontinence** of children, in the **enuresis** of all ages, in the dribbling and lack of control of the urine in the aged, in the relaxed condition of the bladder structures present in plethoric women in whom every cough or muscular effort causes the urine to escape, it is a specific remedy. It tones the muscular structure of the bladder and exercises a desirable influence over the mucous structures of the entire urinary apparatus. It also stimulates secretion within the tubules of the kidneys by its direct influence upon the epithelial cells.

Thuja is an important remedy in the treatment of **spermatorrhœa**, especially if from exhaustion from over-indulgence, or from **masturbation**. Dr. H. C. Noble reported twenty-nine cures out of thirty consecutive cases. In these there was nervous irritation and usually **sexual neurasthenia**. In those cases

in which the mind is seriously depressed by the physical condition, it is of especial service, as it stimulates the nerve forces and delays the discharge until, by general improvement of the entire nervous system, the condition is restored. The influence of the agent will be enhanced by a combination with *avena sativa*, saw palmetto, or *staphysagria*, in cases of this character, when *Thuja* should be given in doses of from two to ten drops, four or five times daily.

As an external application *Thuja* produces at first a sensation of smarting or tingling when applied to **open sores** or **wounds** and it is usually best to dilute it with one, two or four parts of water, or to combine the non-alcoholic extract with an ointment base in the above proportion. This constitutes an excellent mildly antiseptic and actively stimulating dressing to indolent, phagedenic or gangrenous ulcers. It is of much service in **bed sores** and in other open ulcers dependent upon local or general nerve exhaustion.

In **chronic skin diseases** of either a non-specific or specific character, it is a useful remedy. Vegetations of all kinds, especially those upon mucous surfaces, will yield to it readily. It is a useful agent in the treatment of **post-nasal catarrh**, and **nasal polypi**. A small dose internally four or five times daily, with the application of fluid hydrastis in a spray, will quickly retard or remove such abnormal growths. It is also applicable to **sloughing wounds**, and to **phagedena** of the venereal organs. It is a positive remedy in the treatment of **senile gangrene**. It causes gangrenous surfaces to dry without hemorrhage or other discharge, destroys offensive odors and influences granulation.

Professor A. J. Howe cured **hydrocele** almost exclusively by this method. The following is the course he adopted as described in his own words: "In an ounce of warm sterilized water pour a dram of Lloyd's *Thuja*. Mix thoroughly by drawing a quantity into the syringe, and forcing it back repeatedly for a few times, then draw up about two drams of the dilute mixture in the barrel of the syringe to be ready for use. Introduce a large exploring needle into the sac of the tunica vaginalis testis and allow the fluid to escape. Before withdrawing the needle, place the nozzle of the loaded syringe into the needle's open mouth and with a plunge of the piston force the diluted *Thuja* into the cavity recently distended with serum. Then in order to cause the liquid to enter every crevice of the sac of the hydrocele, pinch and knead the scrotum with the fingers quite vigorously. The needle is then withdrawn. The pain induced is quite considerable for at least half an hour, then the patient goes about his business and usually no additional treatment is required." The above method, with some unimportant variations, has been in general use among our physicians since

suggested by Professor Howe, and the result as reported by very many has been satisfactory.

This agent has been used successfully in the treatment of **trachoma**. The non-alcoholic preparation is combined with vaseline or other unctuous substance and applied once or twice daily.

VERBASCUM.

VERBASCUM THAPSUS.

Synonym—Mullein.

Part Employed—The leaves and flowers.

Natural Order—Scrophulariaceæ.

Locality—Europe, North America.

Botanical Description—Mullein is a biennial plant, common in the United States, growing along roadsides and in waste fields, flowering from June to August; stem three to six feet high, straight, stout, occasionally branched, woolly; leaves sessile, oblong, acute, alternate, decurrent, tomentose on both sides, indented at the margin; flowers yellow, disposed in a long, dense, cylindrical, terminal spike; calyx five-pointed; corolla wheel-shaped, five-lobed; stamens five; capsule ovoid, two-valved, many-sided; odor pleasant; taste bitterish. Solvents, alcohol, water. Dose, from fifteen to sixty grains.

CONSTITUENTS—Mucilage, volatile oil, fat, sugar.

PREPARATIONS—Specific Verbascum. Dose, from five to sixty minims.

A preparation may be prepared extemporaneously by breaking off the upper portion of the blossoms of the mullein and putting them into a glass jar and allowing them to stand in the sun for a few days. The mass is then strained through muslin. The juice extracted by the above or other process is called an oil, but does not possess all the properties of an oil.

Therapy—The most direct use of this agent is in the treatment of simple, uncomplicated cases of **deafness**, or in the early stages of progressive deafness where the cause is not apparent. In these cases, from two to five drops in the ear, three or four times each day, will stop the progress of the disease, and will cure many simple cases. In its local influence, it softens and facilitates the removal of hardened secretions, stimulating the nerve structures at the same time. It has positive anodyne properties, and is curative in a large number of the ordinary cases of **earache** in children, acting often more quickly than other and better known agents, and is used with perfect safety, as it has no irritating or toxic properties.

Used in the treatment of **ulcerations** of the ear, where there are fetid discharges, it is of much value in allaying pain and promoting the action of other antiseptic and healing remedies.

In the treatment of the simple ear troubles of childhood, it accomplishes alone that for which complex formulæ are otherwise necessary. Internally, the specific medicine or the infusion exercises a diaphoretic and diuretic influence, and is soothing to the nervous system.

This agent is often used in **irritation** and **inflammation** of the **urinary apparatus**, acting in harmony with hydrangia, gelsemium or other antispasmodics in **stricture** from irritation. It is useful also in acute catarrh, either of a specific or non-specific origin, in catarrhal cystitis, and in some cases of pyelitis and catarrhal nephritis. It has been used also in bronchial irritation and in asthmatic **bronchitis**. In uncomplicated **asthma**, especially the paroxysmal form, mullein leaves, mixed with stramonium and potassium nitrate and smoked through a pipe, will often give prompt relief. The smoking must be suspended if vertigo supervenes.

The agent has long been a domestic remedy in the treatment of rheumatism. A fomentation is prepared from the leaves, or the steam from a decoction is confined to the part, or compresses are wrung from a strong infusion of the leaves, and applied.

SAXIFRAGE.

SAXIFRAGA PENNSYLVANICA.

Synonyms—Tall Saxifrage, kings' evil root, scrofula bush.

Administration—In infusion, from half an ounce to an ounce may be given as a proper dose. Of the tincture, from one to four drams; of the fluid extract, from twenty drops to one dram.

Specific Symptomatology—It is specific as an alterative in **syphilitic affections** of the **eyes**. In glaucoma, in iritis, in ophthalmia, in cataract from syphilitic causes, our doctors have had the most marked results from the use of this remedy.

The agent is an active diuretic and an excellent tonic, as well as possessing active alterative or antiscorbutic properties.

MELILOTUS.

MELILOTUS OFFICINALIS ALBA.

Synonym—Sweet clover.

Part Employed—The flowers and leaves.

Natural Order—Leguminosæ.

Locality—Europe.

Botanical Description—There are two varieties of sweet clover, both natives of the Old World, the yellow and the white. Yellow sweet clover has an erect, sulcate stem, two or three feet high, with blunt leaflets and yellow flowers. White sweet clover has an erect, much branched, sulcate stem, three to six

feet high, with obovate or oblong leaflets truncately notched at the ends, and loose racemes of white flowers; odor strong and agreeable; taste bitterish, aromatic, pungent. Solvent, alcohol.

CONSTITUENTS—Coumarin, melilotic acid, coumaric acid.

PREPARATION—Emplastrum Meliloti, Melilot plaster.

Specific Melilotus. Dose, from one to ten drops.

Specific Symptomatology—Spasms, colic, dysuria, dysmenorrhœa, neuralgia, pain with fullness and throbbing, headache, epistaxis, pleuritic pains, painful cough, spasms from dentition, pain in the stomach, rectum, or uterus, neuralgic rheumatism.

Therapy—Melilotus is a stimulant to the local circulation, and is adapted to those cases where debility or a feeble vital power, as in delicate females and poorly nourished infants, is associated with congestion, as in atonic neuralgias and spasms occurring during the period of dentition, and in congestion of the uterus, ovaries, rectum, bowels, stomach, or bladder in feeble subjects. It is also a remedy for pain from determination of blood, as in headache with throbbing.

An ointment made from the leaves is an efficacious application to all kinds of ulcers.

A fomentation of the leaves and flowering tops may be applied with good effect in inflammation of joints, and local pain in the abdomen.

SARRACENIA.

SARRACENIA PURPUREA.

Synonyms—Pitcher Plant, Sidesaddle Plant, Fly Trap, Water Cup.

Part Used—The fresh root.

Natural Order—Sarraceniaceæ.

Locality—United States. Growing in muddy, boggy places and in wet meadows.

Botanical Description—An evergreen plant, which derives its name from the shape of its petiole, which is a large cup or pitcher-shaped hollow, swelling in the center, with a wing-like appendage, often filled with water; covered above with reversed hairs. The scape holds a single, large, purple, nodding flower. Root, reddish-brown, three inches long, many rootlets, simple, tough, odorless, bitter, astringent.

PREPARATIONS—Specific Sarracenia. Dose, from two to twenty drops. Tincture Sarracenia. Dose, one dram.

CONSTITUENTS—Sarracenin, a resin, sarracenic acid.

Physiological Action—The agent is laxative, stimulating the action of the intestinal glands and the liver and overcoming torpidity. It stimulates the kidneys, inducing an abundant flow of limpid urine. It is an active eliminating agent, exercising a special influence upon the glands of the skin.

Therapy—As a remedy in the treatment of **zymotic disease** this agent has been used with good results. It is given freely during the course of **scarlet fever**, **measles** and **small-pox**, and it is claimed that in every case it modifies the character of these diseases, shortens their course, and prevents sequelæ. It has, as yet, no established place in therapeutics.

CALCIUM SULPHIDE.

Synonyms—Calx Sulphurata, Sulphurated Lime, Sulphuret of Calcium.

Occurrence—This salt is usually obtained from the dried sulphate of calcium, by heating that salt in a crucible to a red heat with powdered wood charcoal.

It is also prepared by heating the flowers of sulphur and oyster shells in fine powder, together, to a white heat, in a crucible.

Description—In either case, a grayish white powder is obtained, which has an unpleasant, nauseating, alkaline taste and the odor of hydrogen sulphide. It is unstable in the air and dissolves readily in, but is chemically altered to a slight extent by, boiling water. It is slightly soluble, but unchanged in cold water.

Administration—It should be thoroughly triturated with sugar of milk, one grain of the salt with a dram of sugar of milk, being a good combination for this trituration. From one to ten grains may be given at a dose, four times daily, but good results will occur from the use of from one-twentieth to one-fourth of a grain of the sulphide, every three hours.

Specific Symptomatology—The agent is specific to glandular, nodular and pustular suppurative inflammations, especially those of the skin. **Carbuncles**, **acne** and crops of boils and small pustules are cured by its internal use. It has been most widely used in overcoming the tendency to the formation of **crops** of **boils**, and is generally relied upon for this purpose. One-twentieth of a grain, four or five times daily, is effectual.

Therapy—It is also given in **scrofulous conditions** for the glandular indurations, or local ulcerations of this dyscrasia, to most excellent advantage.

In **syphilitic diseases**, with persistent bubos or nodular or ulcerative skin eruptions, it is directly indicated. It has been used by excellent authorities in the treatment of tubercular conditions wherever existing.

Shields claimed remarkable results in inflammatory diseases of the air passages. In fetid **bronchitis**, and in fifty cases of **pneumonia** in which he used the drug (in conjunction with quinine and nitroglycerine), the mortality was extremely small.

In tonsillitis and quinsy its action was almost specific. In only four cases out of one hundred and fifty did it fail to effect a complete cure in from two to six days.

A French writer gave a grain of the sulphide every hour to patients with **pulmonary consumption** until gastric irritation occurred. This is an extreme measure, but the author claimed satisfactory improvement. It will certainly relieve the cough of this disease.

It is praised in **tubercular diseases** of the **joints**, as well as those of the skin. If the tubercular conditions are complicated by syphilis, its benefits are especially marked. It is administered in small doses in **bronchial** and **laryngeal** troubles, in **croup** to produce immediate relief, and in persistent and **suffocative coughs**.

This powder is a successful **depilatory**, and will remove hair in a few moments. Applied moist, to the locality to be deprived of hair, it is allowed to remain fifteen minutes, and is then removed with warm water and a sponge.

It may be applied as sulphur, or dilute sulphuric acid, is applied to kill the itch insect and destroy its eggs. This is effectually accomplished in a short time, and the powder should then be washed off.

A writer, some years ago, advised this agent in **small-pox**, claiming that its internal use greatly modified the severity of the disease, and prevented severe pitting. Its physiological influence would suggest its use as rational treatment in this condition.

CHAPTER V.

Iron and Its Compounds.

IRON.	TARTRATE OF IRON AND POTAS-
CHLORIDE OF IRON.	SIIUM.
TINCTURE OF IRON.	CITRATE OF IRON AND QUININE.
SULPHATE OF IRON.	CITRATE OF IRON AND STRYCH-
CARBONATE OF IRON.	NINE.
CITRATE OF IRON.	CITRATE OF IRON, QUININE AND
CITRATE OF IRON AND AMMO-	STRYCHNINE.
NIUM.	PHOSPHATE OF IRON.
TARTRATE OF IRON.	COMPOUND SYRUP OF THE PHOS-
TARTRATE OF IRON AND AMMO-	PHATES.
NIUM.	ARSENATE OF IRON.

FERRUM.

Symbol—Fe.

Synonym—Iron.

Occurrence—Iron is the most common of all the metals. In the manufactures and in the arts it is indispensable. In chemistry, pharmacy, and in medicine it is of great value.

Its history is as old as that of man. It is found free in some meteorites, but is commonest in various ores from which it is easily separated by heat. The principle of these are iron pyrites, micaceous or clay ores, and those containing the oxides, carbonates, sulphates, arsenates, phosphates and oxalates of iron.

Description—When pure, it is a soft, brilliant, silvery-white, crystalline metal, the most tenacious of all metals; malleable and ductile. In dry air it is not affected, but oxidizes quickly in the presence of moisture. At a bright red heat it will decompose water, forming the ferrous or ferric oxide by combining with the oxygen of that medium and setting the hydrogen free.

Physiological Action—Iron is an essential and constant constituent, a proximate of the animal organism. It is taken into the system with the food of which it is a constituent, being absorbed by plants which serve that purpose, from the soil. It floats in the blood as the most important component of the red corpuscle a little less than one-half of one per cent of the total constituents of the red corpuscle, consisting of iron.

It is also present in the gastric juice, bile, chyle, lymph, milk and urine, and in various pigments, notably those of the eye.

During the administration of iron the red blood corpuscles increase in number as well as in their oxygen-carrying power, the quantity of hæmatin and hæmoglobin, and also the total quantity of the blood being increased, at the same time.

By the improvement of the blood and the increased supply of oxygen to the tissues occasioned by the administration of iron when this agent is deficient, the nervous system is directly influenced in a most favorable manner. There is increased strength and a greatly augmented power to resist disease, and to sustain the vital functional operations of the various organs of the body.

An objection to the administration of iron as a medicine is the inorganic character of the agent, which materially interferes with its appropriation. The more nearly we are enabled to approach to an organic compound of iron, the more speedily and satisfactorily will the influence of the agent be exercised. A commendable effort is being made by various manufacturers to separate the iron from pure blood for internal administration.

The matter of speedy absorption must be considered in selecting an iron salt, as elementary iron is not used in medicine, the compounds alone being prescribed. Whatever compound is selected for this purpose the proportion absorbed is very small and the amount given in excess of the appropriation is usually eliminated with the feces, imparting to them a black color.

The oxides, the sulphates, the carbonate, the phosphates, and the chloride of iron are among its most easily appropriated salts. For the application of iron in general, we refer our readers to the consideration of the remarks under the headings of these various salts.

FERRI CHLORIDUM.

Synonym—Chloride of Iron, Muriate of Iron, Ferric Chloride.

Occurrence—This substance is prepared by dissolving iron in hydrochloric acid.

Description—It occurs in fragmentary, crystallized particles of a deep yellow color, without odor, but with an astringent taste, suggestive of the iron itself, and with an acid reaction. It is soluble in alcohol and water, melts at 96 deg. Fahr., and is deliquescent in moist air.

Preparations—The **Tincture of the Chloride of Iron** is prepared by dissolving the chloride in alcohol. It is a clear, dark reddish-brown liquid with a sharp, astringent taste, and an acid reaction. It may be mixed with water in all proportions without precipitation. Dose, from three to fifteen minims, fully diluted.

The **Ethereal Tincture of the Chloride of Iron**, prepared by dissolving one ounce of the crystals of ferric chloride in twelve

ounces of ether which has been mixed with four times its bulk of alcohol. Dose, from two to ten minims, fully diluted.

Therapy—The tincture of the chloride of iron has a wide range in therapeutics, in addition to its direct influence in restoring the **red blood corpuscles**. It exercises a direct **tonic** influence, upon the **stomach** and is also a powerful **astringent antiseptic** and restorative to a high degree, especially in general atonicity without fullness of the blood vessels—with anæmia. It is not a direct nerve tonic, its influence upon the nervous system being exercised through its restorative influence upon the red blood corpuscles, and the consequent renewal of vitality thus induced, enhanced by the increased power of the blood to carry oxygen.

The agent is demanded in **anæmia** which has occurred from the sudden loss of blood from acute hemorrhage. In cases of this character the blood is not impaired and the agent quickly restores to this fluid its full quantity of red corpuscles. It is no less efficient in anæmia from chronic disease or in that form which occurs slowly from a gradual destruction of red corpuscles in the system. In **chlorosis** it acts well, but other forms of iron are usually more efficacious, as it is necessary in the larger proportion of cases to treat other existing conditions, usually disorders of menstruation.

In depraved conditions of the blood, resulting from the **absorption of septic matter** it is a most important remedy. It imparts tone to the system, antagonizing the influence of the poison, while it destroys the ~~the~~ poison itself, at the same time restoring the blood if impoverished. In **local poisoning** where septic material has been introduced into wounds, and the course of the infection is marked by the appearance of active inflammation along the course of the lymphatics, the reddened areas may be painted with the tincture, while it is also administered internally. It may also be applied directly to the wound, but there are milder antiseptics that we may use for this purpose that are less irritating and fully as efficacious.

In the treatment of **acute erysipelas** the tincture of iron has long been considered a specific. It is applied directly to the inflamed surfaces, and at the same time to a narrow area of healthy tissue beyond the line of inflammation. This retards further advancement of the disease, and is especially indicated if the tissues are of a dark, deep red color. Ten drops of the tincture, freely diluted, should be given internally at the same time, every two or three hours.

This tincture was one of the first successful remedies used in the treatment of **diphtheria**. If the mucous membranes are swollen and engorged, and of a deep red color, its influence is exercised most speedily. It is commonly administered in combination with the chlorate of potassium, fifteen grains of the

latter being dissolved in two ounces of water to which a dram of the tincture is added. A teaspoonful of this every two hours may be given to a ten year old child. The tincture may be diluted and used as a gargle, and in extreme conditions the swollen areas, which are covered with the characteristic exudate, may be gently painted with it in full strength.

This simple course of treatment has been very successful in the past, especially when the specific indications of the constitutional involvement have been met with aconite, phytolacca, belladonna, or other indicated measures.

Whenever prescribed, if the indications for an acid in the system are present, such as dark mucous membranes, the narrow, red tongue with thin tip and edges, the influence of the agent is more promptly exercised.

In the treatment of **chronic inflammation** of the **kidneys** where there is a large waste of **albumin**, the tincture of iron is a most efficacious remedy. In these cases there is deficiency of action of all the vital organs, and anæmia. The blood pressure in the kidneys is greatly altered and the general vital force is much reduced. As stated, the possible precipitation of a large quantity of albumin is the indication for its use, although it is beneficial in certain cases where the quantity is not large. In an experience of many years in the treatment of albuminuria, the writer has learned to prefer the ethereal tincture to the ordinary tincture of the chloride in these cases. Five to eight drops of the ethereal, will accomplish the same results as twice that quantity of the ordinary tincture.

The tincture of iron is of much service in the treatment of **pyelitis**, reducing the quantity of pus formed, more rapidly than other agents. The diuretic effects of the tincture are of much service in these cases, especially if dropsy is present as a complication.

It can be at once seen that the wide influence of this agent in these kidney diseases renders it valuable. It stimulates the digestive and appropriative organs, it forms new blood and thereby increases the quantity of oxygen in the system. It increases nerve force and through the nervous system the strength of the heart's action. It thus materially increases the blood pressure in the kidneys, and in every way improves functional activity. It reduces the quantity of uric acid and the phosphates in the urine when excessive, and relieves the consequent irritation. Its antiseptic properties further inhibit the formation of pus.

In pulmonary **tuberculosis** the tincture of iron controls the night sweats, hemorrhage, bronchorrhœa, and diarrhœa, its tonic influence in these cases being most marked.

The styptic properties of this agent render it advantageous in all conditions of passive hemorrhage. Vegetable astringents.

however, have largely replaced the use of the tincture of iron for this purpose.

Binz claims that ether given in conjunction with iron greatly facilitates the absorption of the latter. He especially advises the use of ethereal tincture of the chloride of iron in chlorosis. The author, in a long experience in the treatment of chronic **kidney disease**, has long ago replaced the tincture of the chloride of iron and other non-ethereal preparations by this preparation of the German pharmacopœia. Its action in the consequent anæmia of **albuminuria** is much more prompt, reliable and satisfactory. The smallness of the dose, from three to eight drops, also commends it.

The tincture of the chloride of iron, like many of its other salts, has an injurious influence upon the teeth, acting chemically upon the enamel, destroying and softening it. It precipitates the iron and produces a permanent black discoloration, for which reason it should usually be taken in high dilutions or through a glass tube or a straw.

The tincture in combination with dilute phosphoric acid makes an excellent tonic which may be freely administered after protracted disease, especially in convalescence from malarial disease.

R—Tincturæ Ferri Chloridi	-	-	3iii
Acidi Phosphorici diluti	-	-	3iv
Glycerini,	-	-	5i
Elixir. Simplicis q. s. ad	-	-	5iii

M. Sig. Teaspoonful every two or three hours in water.

This mixture is nearly or quite colorless and very palatable, especially if added to a little water in a glass. In it a chemical change takes place which rather enhances the value of the constituents. In proper doses its influence as a tonic for children is exceedingly prompt and satisfactory. It is given to them also when convalescing from severe stomach or bowel trouble, when the nervous system is debilitated, and the blood is deficient in red corpuscles.

Incompatibles—The chloride of iron is incompatible with the salts of the metallic elements, with the compounds of silver and mercury, with all the arsenates and arsenites, the borates, and all vegetable compounds, especially those containing tannin, albumin or gums.

FERRI SULPHAS.

Synonyms—Green Vitriol, Ferrous Sulphate, Sulphate of Iron.

Occurrence—In the formation of this popular iron salt, iron wire is cut into small particles and added to distilled water. To

this sulphuric acid is added and crystals of the salt ultimately precipitate.

Description—It forms in large monoclinic prisms of a pale, bluish-green color, with a saltish and astringent taste. It is efflorescent in the air, dissolves in one and eight-tenths parts of cold, and freely in boiling water. It is insoluble in alcohol.

Ferri Sulphas Exsiccatus is the sulphate of iron deprived by heat of its water of crystallization. It is a grayish-white powder perfectly but slowly soluble in water. It contains sixty-five per cent of the original sulphate.

Ferri Sulphas Granulatus.

Synonym—Granulated Ferrous Sulphate.

In the preparation of the original sulphate, when the mixture is ready for precipitation, instead of being allowed to precipitate it is reduced nearly one-half by evaporation. This product is filtered after the addition of alcohol. It occurs in the form of a pale, bluish-green crystalline powder, and has all the properties of the original sulphate. It is less liable to oxidize on exposure to the air than the sulphate, and is better adapted for dispensing purposes because more permanent.

For many years the sulphate of iron has been a popular **tonic and restorative**, and is the active constituent of many well known formulæ. In its tonic properties it rapidly supplies iron to the system, and is given without special regard to nice discrimination, in all atonic conditions, where there is **anæmia**. As a restorative to the menstrual function which has ceased in anæmic and chlorotic cases, it is one of the best of the iron compounds. It permits a natural restoration of the function by supplying the necessary iron to the red blood corpuscles, but it is an **emmenagogue** only in such atonic conditions, and will not force a restoration of the function when suppressed from other causes. This agent has powerful astringent properties, and has long been used in both active and **passive hemorrhages**. In chronic **pulmonary disease** its tonic properties are of much value, while its astringent action restrains the tendency to hemorrhage and profuse night sweats. Its astringent and tonic effects are also evident when there is chronic or profuse diarrhœa with tendency to intestinal hemorrhage. As it has the properties of an irritant, it must be given in small doses. One grain every three hours is much better than five grains three times a day, and in many cases one grain three times a day will be quite sufficient. It is a useful remedy in **diabetes**, either of the saccharine or non-saccharine variety. The agent, externally applied, either in the form of a fine powder or in strong solution, will control many cases of traumatic hemorrhage. In solution it is also applied externally to chronic

ulcers and moist **eczema**, and is used in a douche in profuse **leucorrhœa**. It is applicable as a wash in open cancers, especially cancer of the uterus, in the proportion of one or two drams to a quart of hot water. A solution kept in contact with recently extruded piles will sometimes cause their rapid disappearance.

LIQUOR FERRI SUBSULPHATIS.

Synonym—Monsel's solution, solution of ferric subsulphate, solution of subsulphate of iron.

Description—This preparation is not widely different from the liquor of the persulphate of iron, either of which evaporated with moderate heat will yield a light, reddish-brown, deliquescent crystalline substance known as **Monsel's salt**. This solution is not given to any great extent internally, its influence being specifically that of a powerful **local styptic**. In contact with the blood it produces immediate coagulation, the coagulum extending into the open vessels, thus occluding them. In **hemorrhage** of the stomach and bowels it may be given internally in doses of from two to five minims diluted, and in hæmoptysis it may be used in an atomizer, also in bleeding from the post-nasal cavity. For application to wounds the solution is preferable to the powder, as the coagulum from the former is more easily removed than that which forms in the presence of the crystalline salt.

FERRI FERROCYANIDUM.

Formula— $\text{Fe}_3\text{Fe}_4(\text{CN})_{18}$

Synonyms—Prussian blue, ferric ferrocyanide, ferrocyanide of iron.

Occurrence—This is formed by a reaction which occurs between the ferrocyanide of potassium and a solution of the tersulphate of iron in water.

Description—It is a tasteless powder of a deep blue color, insoluble in water and alcohol. It is not widely used in medicine, but when indicated is specific.

Therapy—In **pernicious intermittent** fevers when quinine has apparently lost its, or exerted no, influence, this agent sometimes produces a profound antiperiodic effect. In severe pain of **neuralgic, malarial** or even of uncertain character, appearing periodically, but with *long intervals* of one, three, five or seven weeks, if this agent is given in small doses for a few days preceding the expected paroxysm it will break up the periodicity when every other known measure has failed. The writer treated a case of facial neuralgia in a woman of a very nervous temperament. The attacks were exceedingly violent,

and the patient was susceptible to the action of morphine, and, in fact, ultimately died from the administration of a simple one-fourth grain dose given by a physician who did not understand her idiosyncrasies. The attacks had occurred at regular intervals of five weeks for eleven years without having been controlled but once, and that only for a very short time. There was no reappearance of the pain after this agent was used, for six or seven months. A mild attack after complete exhaustion was then completely controlled, and there was no recurrence for over a year, when in a distant town a physician unfortunately administered morphine for a mild attack, with the result mentioned.

This agent is specific in certain cases of **vomiting**, and should be given in minute doses frequently repeated. In many of these cases the persistency of the vomiting may have withstood other better known agents.

The tonic properties of this salt of iron are not great, because of its insoluble character, other of the salts mentioned serving a much better purpose. In its administration it may be given in doses of from two to five grains, four times daily, in a capsule. Its value is sometimes enhanced by giving it in conjunction with quinine.

FERRUM REDUCTUM

Synonyms—Quevenne's iron, reduced iron, iron by hydrogen.

Occurrence—The process of the formation of this salt consists in combining a solution of ammonia with a strong solution of the perchloride of iron in the presence of zinc, sulphuric acid and the chloride of lime. The decomposition that takes place between the sulphuric acid and zinc generates free hydrogen gas. The reduction of the iron is said to be accomplished by this.

Description—This is in fact a powder of iron, light, tasteless, without luster, and of an iron-gray color. Because of the presence of hydrogen it takes fire readily. It is insoluble in both water and alcohol. It has long been considered one of the very best of the iron tonics. It supplies iron directly to the system, is comparatively free from astringency and irritating properties. It is given wherever a pure iron tonic is needed and is especially available for administration to children. In its administration three grains in a pill or capsule or in the powder may be given every three or four hours.

A test of the purity of this agent may be made by igniting a quantity of it, when it should burn in sparks. If it does not

ignite an impurity is present, probably in the form of an oxide. It should not yield sulphureted hydrogen gas.

Ferrum Dialyzatum.

Dialyzed iron is a common preparation of iron of rather unstable character. It yields up its iron freely in the system and with many practitioners is commonly used in anæmia in preference to other preparations of iron. It is said to serve as an efficient antidote to arsenic without further preparation. It is prescribed in liquid form and is easily precipitated from its solution. The dose of the solution is ten or fifteen minims in water.

FERRI CARBONAS.

Formula— $\text{FeCO}_3 + \text{H}_2\text{O}$.

Synonym—Carbonate of iron.

Occurrence—This salt occurs in nature as an iron ore. It is also formed by the action of an alkaline carbonate, generally the carbonate of ammonium, upon a ferrous salt, usually the sulphate.

Description—Ferrous carbonate is a greenish, amorphous powder, readily absorbing moisture from the atmosphere to form a hydrate, which causes it to assume a brown color. The **saccharated carbonate** is the form in common use.

This carbonate is formed in the presence of sugar which protects the salt against the further absorption of oxygen from the air.

Administration—In the administration of this remedy, while five or six grains during twenty-four hours are considered a small dose, this amount is without doubt, more than is absorbed. There can be no advantage in prescribing a greater amount, although it is not uncommon with some physicians to give ten grains four or five times a day. From one-half to one grain will usually do as well as a larger dose.

Therapy—The restorative powers of this salt are very great, while the facility of its absorption, the absence of irritating properties and its tastelessness render it of especial value in therapeutics. There are but few atonic conditions in which iron is needed where this remedy is contra-indicated, its beneficial action being particularly marked in all debilitated conditions. Its influence upon the stomach is most gratifying, as it stimulates the normal secretion, is not astringent, overcomes rapidly excessive catarrhal discharges by its tonic properties and materially improves the digestion. **Blaud's pill**, which has been popular for nearly a century, contains as its principal constituent, the carbonate of iron. The writer has learned to depend upon

the following formula as a specific in atonic conditions of the stomach, or **catarrhal gastritis**:

Ferri Carbonat.	-	-	-	-	3ss
Hydrastine	-	-	-	-	3ss
Capsici	-	-	-	-	gr. viii

Mix and divide into parts no. xxx, and put in capsules.

Sig. Take one after each meal.

In extreme debility one of these capsules may be given every three hours, but always after eating, however small the amount partaken of, even if no more than a few mouthfuls of bread or any other plain food.

In conditions where quinine is indicated this may be added to the prescription very satisfactorily. In cases which demand *nux vomica*, especially if there is prostration of the nervous system, this latter makes a most valuable addition to the formula. In other cases the crude powdered golden seal may replace the hydrastine to good advantage, but at least double the quantity should be used. Whitford has used this formula for nearly half a century, but with the addition of *xanthoxylum* in the place of *capsicum*.

Very often the formation of boils, inflamed **abscesses**, and especially **pustular** conditions of the skin of the face and aggravated cases of **acne**, depend upon a condition of the blood, which is speedily corrected by the action of this remedy. The formation of **crops** of **boils**, which has continued for months, may be terminated and the boils cured within a short time, by administering a grain of this salt every two or three hours. This is very reliable treatment in these stubborn conditions.

This agent is of much value in the treatment of the **anæmia** present with chorea, and may be combined with other tonics or nerve sedatives. In amenorrhæa, due to anæmia, this agent is of service, as it rapidly improves the condition of the blood, thus promoting the natural restoration of the function.

FERRI CITRAS.

Synonyms—Ferric Citrate, Citrate of Iron.

Occurrence—The citrate of iron is not usually a definite chemical salt. It is prepared by dissolving ferric hydrate in a solution of citric acid.

It occurs in thin, garnet-colored scales, transparent and odorless, with a chalybeate taste. It is completely soluble in cold water, but dissolves slowly. It is insoluble in alcohol.

Administration—This is an excellent form of iron for administration; soluble, easily appropriated, pleasant and crystalline. It may be given in solution, pill or capsule form. The medium dose is five grains, three or four times daily.

FERRI ET AMMONII CITRAS.

Synonym—Iron and Ammonium Citrate.

Occurrence—This salt is also an indefinite chemical compound, made by dissolving the citrate of iron in aqua ammoniæ. In appearance the crystals resemble those of the citrate, are readily soluble in water and deliquescent in the air.

Administration—It is given in solution, as its deliquescent properties render it unsuitable for compounding in pill mass. It is both a stimulant and tonic, but is not markedly preferable to the citrate, as it can only be given when there is no gastric irritation. It is, however, a useful form of soluble iron. Dose, five grains.

FERRI TARTRAS.

Synonym—Tartrate of Iron.

FERRI ET AMMONII TARTRAS.

Synonym—Tartrate of Iron and Ammonium.

FERRI ET POTASSII TARTRAS.

Synonym—Tartrate of Iron and Potassium.

Occurrence—These salts need not have separate consideration. They are made by dissolving the ferric hydrate in tartaric acid, either alone or in the presence of ammonia or a potassium solution. In the alkaline combinations they form double tartrates.

Description—They occur in the form of scales, similar to the citrates, varying from a garnet to a reddish-brown color, and are deliquescent and freely soluble. They are analogous to the citrates in many particulars, but may be given in larger doses, up to twenty grains. Because of their mild influence, free solubility, and ready appropriation, they are especially applicable to the diseases of children where the necessity for iron is indicated. Dose, five to ten grains, given preferably in solution.

FERRI ET QUININÆ CITRAS.

Synonym—Citrate of Iron and Quinine.

FERRI ET STRYCHNINÆ CITRAS.

Synonym—Citrate of Iron and Strychnine.

FERRI ET QUININÆ ET STRYCHNINÆ CITRAS.

Synonym—Citrate of Iron, Quinine and Strychnine.

Occurrence—These salts are commonly prepared by dissolving the citrate of iron and ammonium, above described, in water and adding a solution of quinine or strychnine, or of both, prepared in citric acid.

Description—They occur in thin, transparent scales of

a greenish-red, or reddish-brown color. All are freely soluble and deliquescent.

Administration—They are given in doses of from two to five grains, and are best dispensed in a syrup or aromatic vehicle as they are exceedingly bitter. A good extemporaneous method is to make up the prescription by completely dissolving the total quantity of the citrate in about seventy-five per cent of its total liquid bulk of equal parts of water and simple elixir, and subsequently adding twenty-five per cent of syrup of liquorice. If the crystals are entirely dissolved this will make a comparatively permanent and palatable compound.

Therapy—They are excellent tonics and act in a satisfactory manner in debilitated conditions where their constituents are plainly applicable.

They have the restorative properties of iron, the tonic but not the antiperiodic properties, of quinine, and the nerve stimulant properties of strychnine in its compounds.

In **malarial** regions where there are apt to be **malarial complications** with all fevers and acute inflammatory conditions, these salts are of great efficacy. Appropriate selection may be made according as the **debility** involves the **nervous** system, or the functional operations of the vital organs, or the assimilation of nutrition.

FERRI PHOSPHAS SOLUBILIS.

Synonym—Soluble Ferric Phosphate.

Occurrence—This salt is formed by mixing solutions of the citrate of iron, and the phosphate and bicarbonate of sodium. It is then washed, filtered and precipitated.

Description—It forms in thin, bright-green, transparent scales, odorless, with an acid reaction. It is unstable in the light and moist air. It is freely soluble in water, but insoluble in alcohol.

This salt is given in doses of from five to ten grains in syrup or in aromatic elixir.

Physiological Action—It possesses the tonic properties of both iron and phosphorus. Both of these substances are actual food for the brain and nervous system and in debilitated conditions where there is lack of nutrition of the nervous system, this salt is important, although not as valuable as free phosphorus or a combination of the iron and alkaline phosphates.

Therapy—It is indicated in those conditions following **exhausting diseases** where the **exhaustion** is apparent in inactivity of the digestive and appropriative organs, and in diminished nerve force. In the cure of many forms of **indigestion**, the phosphate of iron performs an important function. It increases

the tone of the stomach, and stimulates the secretion of the gastric and intestinal juices.

FERRI PYROPHOSPHAS SOLUBILIS.

Synonyms—Soluble pyrophosphate of iron, soluble ferric pyrophosphate.

Occurrence—This salt is made in the same manner as the phosphate except that sodium phosphate, is replaced in the formation of this salt, by sodium pyrophosphate.

Description—It occurs as light-green transparent scales, odorless, with a slightly salty taste, freely soluble in water, but insoluble in alcohol. It has all the virtues of the phosphate, with none of its disadvantages, and is readily absorbed.

Dose. From two to five grains.

Therapy—It is given in **anæmic** conditions where debility is marked or where there are evidences of **neurasthenia**. In convalescence from prostrating disease where there is general loss of nerve power, this agent in many cases will be found superior to the phosphate. It is further applicable in all cases where the phosphate is indicated.

Compound Syrup of the Phosphates.

For perhaps forty years there has been on the market a syrup known as Parrish's Chemical Food, the Compound Syrup of the Phosphate of Iron, or the Compound Syrup of the Phosphates. This compound was widely used with success in nervous prostration, but the complex character of its formula, which was afterwards made known by Dr. Parrish, makes it difficult to prepare. It has recently been replaced by other manufacturers by a palatable and efficient syrup of the phosphates. The following is the original formula of Dr. Parrish, but it is much too complicated for general prescribing, in fact, the character of its constituents are such that it is inadvisable to undertake to construct it unless skilled in pharmacy. Simpler combinations, or the direct prescribing of its single constituents, will often prove of greater service:

Phosphate of Iron,	-	-	-	-	3x.
Phosphate of Sodium,	-	-	-	-	3xii.
Phosphate of Lime,	-	-	-	-	3xii.
Glacial Phosphoric Acid,	-	-	-	-	3xx.
Carbonate of Sodium,	-	-	-	-	grs. xv.
Carbonate of Potassium,	-	-	-	-	3i.
Hydrochloric Acid, water and ammonia, of each					a sufficiency.
Powdered Cochineal,	-	-	-	-	3ii.
Distilled water,	-	-	-	-	sufficient to make 3xx.

To this is added the oil of orange and sugar. The ingredients are then carefully combined.

It is given in doses of one dram three or four times daily, in water.

In an extreme case of "starved nerves" in a pregnant woman where there was **spinal irritation** in a most exaggerated form, with violent insanity, the writer relieved the entire train of symptoms, restoring perfect mental action and producing quiet and rest, which had not been produced for six weeks previously, except by the continued use of morphine, in less than ten days, by the use of Parrish's syrup in frequent doses and forced concentrated nutrition.

Spinal irritation will yield more quickly to this combination than to any of its single constituents. It is demanded in all cases of nervous prostration with **anæmia**. It is advisable not to continue the use of any single tonic or restorative in nervous prostration for a greatly prolonged period; better results are obtained by selecting two or three of this class of preparations which seem to be adapted to the case, and rotating them in order, changing every twenty-one or twenty-eight days.

FERRI OXIDUM HYDRATUM.

Formula— $\text{Fe}_2 (\text{OH})_6$.

Synonyms—Ferric hydrate, ferric hydroxide, hydrated oxide of iron, red oxide of iron, hydrated peroxide of iron, hydrated sesquioxide of iron.

Occurrence—This salt of iron is prepared by dissolving ferric sulphate in water, and adding aqua ammoniæ. It may be extemporaneously prepared for immediate use by adding to a given quantity of a solution of ferric chloride, four times its bulk of pure cold water. This is then treated with aqua ammoniæ until the ammonia is in excess, and constantly stirred. The precipitate is washed in water and strained through a muslin filter, and again washed until all alkalinity is neutralized.

Therapy—This substance has no practical use in therapeutics beyond its power to at once convert arsenous acid into an insoluble arsenic compound of iron, which is comparatively innocuous.

When arsenic has been taken into the stomach this antidote can be at once prepared and administered. It is given in teaspoonful doses of the moist magma every few minutes until a quantity equal to at least twenty times the bulk of the arsenic taken, has been administered. It is then advisable to at once introduce the stomach pump and thoroughly evacuate the stomach, or evacuation can be accomplished by the use of an emetic. Another dose of the hydrate may then be administered

and allowed to remain in the stomach, if the evidences are sufficiently conclusive that the neutralization of the arsenic was complete before evacuation.

FERRI ARSENAS.

Synonym—Arsenate of Iron, iron arsenate.

Occurrence—This salt is formed from a mixture of solutions of sulphate of iron, arsenate and bicarbonate of sodium.

Description—It is a white, amorphous substance when first formed, but on exposure to the air turns green, being converted into the ferroso-ferric arsenate. It is odorless and tasteless, insoluble in water, readily soluble in hydrochloric acid.

The arsenic is the most active constituent of this compound. It cannot therefore be given in doses sufficiently large to produce a marked characteristic influence of the iron.

Administration—It is administered in pill form in doses of from one-sixteenth to one-eighth of a grain three times daily. The smaller dose should be used in the beginning, and it will seldom be found necessary to administer a larger one than one-tenth of a grain.

Therapy—Its direct administration is in those diseases of the skin where arsenic is of acknowledged value, when accompanied by anæmia or a blood dyscrasia. In cases of eczema, where there is prostration, it has been of much service, and is more useful if the disease is of the dry than if of the moist variety. It is of much value in scaly conditions, with extreme inaction of the glands of the skin. Some cases of impetigo, psoriasis, and even lepra, yield to it. In chronic diarrhœa, where there is impairment of the red blood corpuscles, it is of value.

CHAPTER VI.

Iodine and Its Compounds, Etc.

IODINE.	POTASSIUM IODIDE.
TINCTURE OF IODINE.	SODIUM IODIDE.
DECOLORIZED IODINE.	FERRI IODIDUM.
COMPOUND SOLUTION OF IODINE.	ACIDUM HYDRIODICUM.
OLEUM MORRHUÆ.	

IODINE.

Symbol—I.

Occurrence—Iodine was discovered by Courtois in 1811, in the mother liquor of a solution of the ashes of seaweed, from which the soda salts had been precipitated by crystallization. It is never found free, but in combination with an alkali in the ashes of seaweeds, and in sea water. It is also found in the sponge, in sea polypi and in cod-liver oil. It is at present produced in large quantities in Chili from the native Chili saltpetre, which contains the nitrate and iodate of sodium. It received its name from its violet-colored vapor.

Description—It is a purplish-black crystalline solid, occurring in friable, rhombic plates. It has a metallic luster, a characteristic odor and a sharp, acrid taste. It is slightly soluble in water, one part dissolving in seven thousand of that fluid, and readily soluble in alcohol, ether, chloroform and carbon disulphide. It is the least active, chemically speaking, of the halogens. It does not possess active toxic properties, but destroys animal tissues, causing a yellowish discoloration of the skin. It reacts readily with starch, forming the deep-blue, starch iodide. This reaction is so delicate as to reveal the presence of Iodine in three hundred thousand parts of water. The disulphide of carbon will react upon Iodine in one million parts of water, producing a peculiar purplish color. Iodine melts at 225 deg. and boils at 347 deg. Fahr., giving off a purplish vapor. It sublimes at all ordinary temperatures.

Administration—Iodine is given in the aqueous solutions hereinafter named, or in the form of the tincture, or in its compounds. The crystalline substance is not a desirable form for administration, although sometimes so prescribed.

Physiological Action—In its influence upon the nervous system Iodine produces depression of spirits, mental distress and disinclination to exertion. There is lassitude, muscular debility and increasing feebleness, with depression of the heart and circulatory apparatus.

In its influence upon the stomach in small doses it acts as a tonic and sedative, in large doses producing salivation, general discomfort and colicky pains; in extreme cases vomiting and purging. In excessive doses Iodine has produced death by ex-

citing severe gastro-enteritis. With this condition there are a rapid and feeble pulse, deathly pallor, and irritation of the kidneys, with ultimate suppression of urine.

Iodism, from the protracted use of this agent in any form, manifests itself by a peculiar metallic taste in the mouth upon rising in the morning, increased salivation, with sore mouth and tenderness of the gums, irritation of the post-nasal cavity, and perhaps watery eyes, the symptoms closely resembling those of hay-fever or rose cold. There is an eruption upon the skin, acne rosacea appears and this is followed by boils, or perhaps purpura. There is sore throat, in many cases severe and painful, and an excessive frontal headache. Some patients are exceedingly susceptible of the above symptoms and even nervous phenomena with impaired vision, paresis, anæmia, and atrophy of the glandular organs, especially of the mammary glands and testes, with a marked loss of sexual power, may appear in many cases. As an antidote starch and starchy substances may be freely administered, and a solution of the bicarbonate of sodium and occasional hypodermic injections of the active stimulants, are sometimes indicated.

Iodine has been called the king of **alteratives**, but no satisfactory explanation has yet been given of its influence in this line. It is argued that the virtues of all vegetable alteratives are exercised through the Iodine they contain. We have vegetable alteratives which are possessed of equal and in some cases greater powers than Iodine, and are more readily eliminated, in which Iodine is not conspicuous as a constituent.

In harmony with the teachings of Germain-Sée, Iodine probably stimulates a more perfect absorption of nutritive material, and encourages perfect elimination of all waste products. This elimination takes place with much activity through the skin, kidneys, salivary and mucous glands, especially those of the intestinal canal. When the compounds of Iodine are taken by nursing women, Iodine is found abundantly in their milk. The elimination of its salts and the waste products through the skin produces irritation and often pustulation. In medicinal doses Iodine increases the appetite, especially if there be an excess of acid; it promotes digestion and stimulates the absorption of nutritive material. Because of its insolubility, the simple agent is seldom given internally, but generally in the form of one of its compounds.

Therapy—In the form of an inhalation, Iodine is of much benefit in disease of the **nose, throat** and **bronchi**. The influence upon the mucosa of these passages is direct. **Ulceration**, with a watery discharge and a feeling of fullness in the head, across the face and eyes, often inducing frontal headache, is relieved by these inhalations.

In **chest** troubles following **measles**, these inhalations are

somewhat beneficial; also in **irritation** of the **trachea** or **larynx**, of either an acute or chronic character, especially in children, evidenced by a hoarse, hollow, dry cough, or wheezing respiration, induced by slight exposure to cold.

In conditions where there is an exceedingly free expectoration, especially if this has a bad taste or odor, as in some cases of **bronchitis** or **phthisis**, and especially in purulent conditions following prolonged **pneumonitis**, inhalations of Iodine have long been in use. A narrow-mouthed pitcher may be filled with hot water, and on this may be dropped from twenty minims to half a dram of the tincture of Iodine. The vapor of this should be inhaled directly for about five minutes, the head and the pitcher being closely covered.

Veterinarians depend greatly upon inhalations of Iodine in their treatment of **catarrhs**, **distempers** and persistent discharges from the nasal mucous membranes of horses.

TINCTURE OF IODINE.

Occurrence—Prepared by dissolving two ounces and two hundred and fifty grains avoirdupois of iodine in thirty-three fluid ounces and three hundred and ninety minims of alcohol.

Physiological Action—Applied to the skin this preparation produces a local inflammation following a primary irritation. It separates the cuticle from the dermis slowly with only desquamation, or immediately, with the production of a blister which contains serum. The application often causes much pain, some patients being especially sensitive to it. In order to derive benefit from the application of iodine, the soreness that exists must be found in the deep muscular structures or in the parenchyma of the organ or gland, since if the soreness is in the skin only it is apt to be increased by the application, in which case belladonna applied will be found curative.

The tincture of Iodine is applicable in **enlarged glands**, in **goitre** and in **scrofulous tumors**, and in **hydrocele**. It is beneficial in enlargement and in **congestion** of the **ovaries** with pain, and is useful in erysipelas, applied over and beyond the inflamed area. In this form the agent is not usually given internally because of its easy precipitation and lack of absorption. The skin is painted with the full strength tincture once each day, or once in two or three days for a short time only.

Therapy—It has been applied with good results in acute inflammation of the lungs, and in **pleuritis**, **bronchitis** and **phthisis**. It may be applied over the spinal ganglia in **spinal irritation**. At one time it was common practice to inject iodine into glandular structures, into bronchoceles, into the tonsils, into abscess cavities and tumors and into malignant growths, but this course

is not now generally adopted. It is applied to **bubos** in the developing stage, and if the inflammation is not too far advanced produces rapid abatement of the symptoms. At one time it was applied to the internal lining of the womb in chronic sub-involution or chronic metritis, but although still advocated by a few it is replaced by as effectual and less severe measures. If the compound solution is diluted with water it may be used as a vaginal douche, in **leucorrhœa** and in some cases of thickening of the os uteri or simple ulceration.

In **chilblains** the tincture of iodine carefully applied is rapidly curative, but is best applied in a diluted form, or rubbed up with an ointment base. The tincture may be applied in **tinea tonsurans**, in **tinea circinata** and in other parasitic skin disorders. It is not always best applied in full strength, but may be thoroughly mixed with a bland oil, vaseline or lanolin. The application of iodine to the gums is advised in cases where the **teeth loosen** and the **gums retract**, especially in the aged. A colorless aqueous solution made by dissolving one grain with two grains of the iodide of potassium in an ounce of water will be found an excellent form for this purpose. This may be painted freely on the gums twice daily. It will also remove **tartar**.

DECOLORIZED IODINE.

Synonym—Compound tincture of iodine.

Occurrence—This preparation is made by dissolving half an ounce each of iodine crystals and potassium iodide in one pint of alcohol. The **compound solution of iodine** is made by dissolving seventy-seven grains of iodine and one hundred and fifty-four grains of iodide of potassium in three ounces and two hundred and thirty-one grains of distilled water. Either of these solutions may be given in doses of five minims three or four times daily, freely diluted with sweetened water. The decolorized tincture internally is absorbed without precipitation. It may also be painted freely over the surface of the skin, with results in every way similar to the tincture of iodine, without producing irritation. The tincture must be applied if the irritant effect is desired.

POTASSIUM IODIDE.

Formula—KI.

Synonyms—Kalium Iodatum, Iodide of Potassium.

Occurrence—This salt is prepared by adding iodine slowly and in small quantities to a solution of potassa, until the whole acquires a permanent brown color. The solution is then evaporated to dryness, the residue is pulverized and thoroughly mixed with finely-powdered charcoal. This is put into an iron

crucible, heated to a red heat and fused; when cool, it is dissolved in boiling water, filtered, washed and precipitated.

Description—The iodide of potassium occurs in the form of crystals, transparent or translucent, whitish, cubical in shape, with a faint, iodine-like odor, and a pungent, saline, brackish, afterwards bitter taste. It also occurs as a white granular powder, or in opaque crystals, or if old it may assume a yellowish or brownish color from the escape of free iodine. It is freely soluble in both cold and hot water, in eighteen parts of cold and in six parts of boiling alcohol, and in two and one-half parts of glycerine. It is deliquescent, not always stable, and should be kept for purity, in dark, glass-stoppered bottles.

Administration—It is given in doses of from one to twenty grains in solution in water or syrup. In patients not accustomed to its use, the desired results may at first be fully obtained by the minimum dose. Especial susceptibility is shown by the appearance of soreness of the throat or nose, or other evidences named under iodism.

Physiological Action—This salt is so readily eliminated through the saliva that it is almost constantly tasted after it has been taken a short time. It is readily absorbed into the blood where it is claimed that all iodides are changed into the iodide of sodium, although there is much to disprove such a conclusion.

The general influence of the iodides is similar to that of iodine. They depress the functions of the organs of the body, encourage destructive metamorphosis and rapid elimination of morbid products, and retard constructive metamorphosis. While they thus encourage elimination their action may easily be carried so far as to produce a deleterious influence upon the blood and its corpuscles. They deprive the blood both of fibrin and albumin, and prevent oxidation, and restoration of muscular tissue and other structures. One great advantage the iodides have over many inorganic remedies is that they are very freely eliminated from the system by all emunctories. It is usually from their use in large doses that they are found in the system and produce unpleasant effects. As confidence is gained in vegetable alteratives, these among practitioners of rational medicine are usually prescribed, instead of the iodides or other inorganic alteratives.

Echinacea promotes even more rapid removal of morbid products than iodine, and at the same time stimulates constructive metamorphosis, improves the blood, increases the number of its red corpuscles, adds tone and vital power to the nervous system, thus increasing the functional activity of all organs. However true these statements may be, we have by no means advanced to the point where we can entirely replace iodine and its compounds with organic remedies.

Specific Symptomatology—Potassium iodide is especial-

ly indicated when there is a pale leaden color of the mucous membranes of the mouth and tongue, as its influence under these circumstances is more speedily apparent. It will not act well if there is irritation of these mucous membranes, or of those of the stomach and intestinal canal, as shown by a narrow, pointed, red tongue with thin edges. Its prolonged use has produced oxaluria, albuminuria and also Bright's disease, in which its elimination by the kidneys is greatly retarded. It is demanded in blood dyscrasias, such as syphilis, scrofula and chronic glandular inflammation with enlargement and induration.

Therapy—When cachexia of any character is present this salt is an important remedy. In the treatment of chronic enlargements of glands, or organs, it is first thought of, the glands concerned in elimination being first influenced. In **goitre**, in **bronchocele**, in **enlarged lymphatic glands**, it has long been used and has come to occupy a permanent place in the therapeutics of such conditions. It should be avoided, however, if there is a breaking down of the structure of the gland with pus formation, as the sloughing process is apt to increase, and is more difficult of cure while this agent is used. Its use in the treatment of **enlarged thyroid** or of **exophthalmic goitre** is attended with some degree of danger, especially if used both externally and internally at the same time, as the blood may not be able to eliminate the great amount of waste material thrown into it until serious damage is done. This occurred under the indirect observation of the author, where the circumference of a greatly enlarged thyroid was reduced seven inches in three weeks. The elimination must be encouraged by all possible auxiliary measures, in order to avoid this danger.

Chronic enlargement of the **spleen** or **liver** is directly influenced by this agent. It is advised in the chronic malarial poisoning to which these enlargements are often due. If there is functional derangement of these organs the agent is of especial value, as it is believed to encourage a flow of the bile and correct catarrhal conditions of the common duct. Iodide of ammonium is in some cases more efficacious than the iodide of potassium when these conditions exist.

In the treatment of **syphilis** potassium iodide is an acknowledged specific among all schools of physicians. It is advised in those cases which are slow of development with gradually progressive phenomena, and is especially the remedy for the secondary and tertiary stages of the disease. It was used by the older physicians in large doses long continued. The fact that large doses can be well borne by those not habituated to the remedy, is considered as proof of the extent and severity of the syphilitic infection, the amount that can be borne, being to a certain degree an index of the extent of the infection.

All syphilitic disorders of the nervous system demand this

remedy. These are neuralgias, meningitis, paralysis, epilepsy, mental aberration, sclerosis of the spinal cord, and all conditions resulting from the deposit of nodes and gummata. It has also been used in **spina bifida**. It can hardly be said to have a direct action upon the nervous system, but it removes the causes of disease and stimulates the removal of waste, thus indirectly encouraging nutrition. It is advantageous when nodules are thought to have formed upon the membranes of the brain.

In the following conditions depending upon syphilitic taint this agent is accredited with specific properties: **Skin eruptions** of whatever character, **syphilitic iritis**, **periostitis**, **nodular conditions** and **gummata**, in all of which this agent is usually the first remedy prescribed. In all forms of **disease of the bones** from syphilis, especially if there are nodes, or enlargements, and in **tubercular** or other **joint diseases**, this agent is of first importance. In small doses, frequently repeated during the day, it is a specific for **pains** of an irregular character occurring from no apparent cause, in the **bones** or **muscular structures**, during the night—**nocturnal pains**, especially if there be a syphilitic diathesis.

Potassium iodide has exercised a most beneficial influence in many cases, in the treatment of **diphtheria**. It is usually given in small doses, which are often repeated, and a solution of the salt alone, or a solution of the salt to which is added one-half as much iodine, is used as a gargle, properly diluted.

This iodide is credited with much power in the removal of **effusions** following active inflammation, and also in the removal of the indurations present as the result of inflammation, and in the softening of inflammatory deposits. It is given after pleuritis, and in the latter stages of pneumonitis to overcome hepatization and to eliminate or stimulate the reabsorption of inflammatory products. This effect is produced fully as satisfactorily in non-syphilitic as in syphilitic cases.

Iodide of potassium is probably the most popular of remedies in the treatment of **aneurism**. Balfour, Huchard, Ringer, Roberts, Chuckerbutty, Bartholow and many others speak of it in this condition with great positiveness. It relieves the pain most satisfactorily, and in some cases, usually the more recent ones, the tumor is slowly reduced in size and its pulsations are rendered less conspicuous and less painful. The dose has been slowly increased in quantity until more than two drams per day have been given and have been well borne. In severe cases its use should be persisted in, as a cessation of only a day or two is followed by increased pain.

In **aneurism** of the **aorta** its influence has been most satisfactory in relieving all pain, while firm thrombosis within the sac has occurred and the pressure symptoms have been reduced.

While at a certain stage of **Bright's disease** this agent will

produce suppression of urine, in the earlier stages while the epithelial cells of the glomeruli are yet intact, the potassium iodide will stimulate a greatly increased flow of urine, sometimes quite quickly relieving severe **dropsy**. If the heart is involved it will greatly relieve the action of that organ. It has been given in **angina pectoris** with good results in very many cases.

It is now but seldom that we have to treat **mercurialism**, a condition that at one time was very common. In its treatment the iodide of potassium was the principal agent used. In **ptyalism** it was used, as of first importance, and in tremors, and in rheumatic or other pains caused by the use of this agent, the iodide was commonly used. It was thought to increase salivation in some cases and to cause the reappearance of mercurialization after the phenomena had once disappeared. Ringer explains this phenomenon by the theory that the iodide causes the insoluble albumin compounds of mercury to set free the mercury in some soluble form, when it will act as before. The mercury from these insoluble compounds doubtless forms a soluble iodide in its union with the iodine of the potassium salt, and the re-mercurialization is the characteristic action of this soluble mercuric iodide.

This agent is commonly used in the treatment of **lead poisoning**. It stimulates the elimination of all metals, probably by combining with them to form iodides, which are more easily eliminated. As a remedy for the removal of any metallic substance it should be given in small doses, that the process of the conversion of the metal into a soluble iodide may not be too rapidly hastened. Efforts should be constantly made to remove the metallic iodide from the system as rapidly as it is formed, that none may accumulate to cause the recurrence of the symptoms of the poisoning by the metal. The solution of potassium iodide applied to **tender areas**, especially if from **congestion** or acute inflammation of a **serous membrane**, as in **pleuritis** or in **peritonitis**, is often of much value. It acts best if diluted and applied hot in such cases. It is also valuable when applied to **enlarged** and **inflamed glands**, and to hardened, sore or tender muscles, or to inflamed portions of muscular structure, also to bruised or strained joints, and to rheumatic or tubercular arthritis or synovitis.

SODIUM IODIDE.

Formula— NaI .

Synonyms—Natrium Iodatum, Iodide of Sodium.

Occurrence—The iodide of sodium is prepared from a solution of caustic soda in a manner similar to that in which the potassium salt is produced from caustic potassa.

Description—It occurs in the form of crystals, isomorphous with those of the potassium salt, and has similar but less active properties, but is more soluble, however. Dose, from one to twenty grains in water or syrup.

Physiological Action—Its influence upon the system is similar to that of the potassium iodide, but milder. It has but little irritating influence upon the stomach and intestinal canal, and is almost entirely devoid of any depressing effect upon the heart. It is really preferable in every condition to the potassium salt, as it yields up its iodine much more readily, but the potassium salt has been longer in use and has the experience of the mass of the profession to confirm its influence.

Therapy—The therapeutic action of sodium iodide is fully considered under that of the potassium salt.

FERRI IODIDUM.

Synonyms—Ferrous Iodide, Ferrum Iodatum, Iodide of Iron.

Occurrence—This salt is formed by the direct union of iodine and iron.

Description—It is a greenish-black crystalline substance, very deliquescent, possessing an astringent chalybeate taste when recently precipitated. It is fully soluble in both hot and cold water, but is converted into ferric oxide when exposed to the air for some time, and this is less soluble.

It is an unstable salt, and must be preserved in solution. Prepared in the proportion of seven parts of iodine, four and one-half parts of iron and forty parts of glycerine, it forms a permanent emerald-green solution, which may be added to syrups or elixirs and rendered palatable.

The **syrup** of the **ferrous iodide** is of a pale-green color and is quite palatable. It is subject to decomposition on long standing, turning to a deep-red color. It is given in doses of from fifteen drops to a dram, about thirty minims being the proper dose for continued administration.

Physiological Action—The agent is an alterative tonic. It possesses the properties of iron more prominently than those of the iodine. It stimulates the action of the stomach, improving both digestion and assimilation. It stimulates peristaltic action of the bowels, acting in some cases as a laxative, with blackened stools, instead of as an astringent as other iron salts. It is an intestinal antiseptic.

Therapy—When there is **scrofula** or a mild **syphilitic taint**, with **anæmia** or **impoverished blood**, this is the remedy. It is demanded under these circumstances when there are scrofulous enlargements of any of the glands, when there is obstruction from a dyscrasia or inactivity of the visceral organs.

In the disorders of females suffering from the effects of scrofula, syphilis or tubercular disease, this agent is exceedingly valuable. It is prescribed with success in **chlorosis**, overcoming the dyscrasia and improving the condition of the blood.

In the amenorrhœa common to anæmic and chlorotic patients, this agent acts directly. It improves the blood and stimulates or encourages a normal return of the function, but does not induce a return before the system can stand the drain. In **leucorrhœa** and other disorders of a general atonic character, it is valuable, especially if any dyscrasia is present.

It has long been used as an auxiliary remedy in **phthisis pulmonalis**, and in all **tubercular diseases** of the **joints**, bones and skin. It is excellent taken in conjunction with cod-liver oil and other restorative agents, and with tonics.

ACIDUM HYDRIODICUM.

Formula—HI.

Synonym—Hydriodic Acid.

Occurrence—This acid is the direct result of a chemical reaction that occurs between iodine and phosphorus in water. It is a colorless gas, fuming on exposure to the air, which can be liquefied and solidified by pressure and a low temperature. It dissolves readily in water, but the solution is unstable, as crystals of iodine will precipitate from it.

The Syrup of Hydriodic Acid contains one per cent of the absolute acid. Dose, from five to twenty minims.

Therapy—The agent is indicated whenever iodine is indicated and is especially adapted to those cases in which an alterative is needed, in which there are the usual indications for an acid. It liberates its iodine freely within the system in the nascent form. It is thus active in **strumous cases** of whatever character. It is useful in such cases as a restorative, when there is **catarrhal bronchitis or pneumonitis**.

It is especially useful in **scrofulous skin disorders**, and has been widely used under these circumstances.

In old standing gouty and rheumatic cases with deposits about the joints, its persistent use has produced good results. It produces the greatest satisfaction when the indications for an acid are present.

OLEUM MORRHUÆ.

Synonym—Cod-liver oil.

Occurrence—This oil is separated by the action of heat not exceeding 180 deg. Fahr. from the liver of the cod-fish (*Gadus Morrhua*).

The process at present adopted for separating the oil is in

every way superior to the old method, in which groups of fishermen would throw all the livers of an entire fishing season into barrels and leave them until summer, when the oil was separated from the decomposed mass. The livers now are usually sent, as soon as the fish are caught, to separating establishments where the oil is separated by the action of steam, at the above temperature. There is a variety of methods of separation adopted, the quality of the oil depending much upon the method.

A very pure oil is made by macerating the livers in hot water or heating them by steam at low pressure for some hours, after which they are thrown upon a strainer through which the oily portion passes into a cask, as with the oil there is also a considerable quantity of water, the impure oil rises to the top and is drawn off into small casks and cooled to a low temperature. It is then put into canvas bags and submitted to an extreme pressure when the pure oil is forced out and bottled. The residue, composed of disintegrated particles of liver, stearin and a tallow-like substance, is used in the manufacture of soap.

Description—It is a fixed oil, colorless, or pale-yellow when pure, of light consistence, with a slightly acrid, somewhat fishy taste, and a characteristic odor. It has a specific gravity of 0.92, is soluble in alcohol, and freely soluble in ether and chloroform.

Constituents—It contains butyric, oleic, acetic and sulphuric acids and glycerine, salts of magnesium and calcium, and in addition iodine, bromine and phosphorus in considerable quantities.

Administration—A tablespoonful four times daily is the adult dose. Mixed with syrup of orange-peel or aromatic syrup, or elixir, its taste is partially concealed. It is also given in hot coffee, milk, brandy, wine, or whisky. Sometimes a little salt added to it covers its taste. It is also given in the froth of porter, or of an egg, well beaten. If two hundred parts of this oil are rubbed thoroughly with one part of the oil of bitter almond, the taste is most effectually concealed; or equal parts of the oil, and bitter almond water may be shaken together in a large bottle, allowed to stand for a day and then separated.

Physiological Action—In cod-liver oil the organic constituents are present in a vitalized form, hence the medicinal constituents are absorbed and appropriated in a natural manner, in perfect harmony with all the vital processes. It has nutritive properties of high value and at the same time is an active alterative.

It is not well received by all stomachs, hence the necessity for the preparation of palatable emulsions. It increases the appetite, improves the quality of the blood and increases the number of red corpuscles. It increases the power of the heart and the strength of the pulse, adding, at the same time, to the general strength and weight. It materially assists in the elimina-

tion of morbid material—retrograde waste—from the blood, and exercises a beneficial influence over scrofulous, syphilitic, tubercular and other cachexiæ.

Its common use in **phthisis pulmonalis** at once directs attention to it as a cure for that condition. It must be begun early in the history of the disorder, in which its influence is first upon the cachexia, and secondarily, as a nutrient upon the general system. It has a beneficial action in chronic diseases of the respiratory apparatus, but when directly from tubercular or specific disease, the stomach must receive it readily, without great disgust or nausea, and its use must be persisted in, sometimes for many months.

In **tubercular arthritis** or **scrofulous inflammations** of the joints, its persistent use is attended with the best results. In *tabes mensesenterica* its influence is satisfactory, also in spinal or hip-joint disease, but to a limited extent.

In the treatment of **rachitis** and other scrofulous conditions of infancy its influence is marked, especially if given persistently with other directly indicated remedies. In greatly debilitated patients its influence is especially apparent if there is predisposition to scrofula, under which circumstances it may be administered by inunction. It should be thoroughly rubbed over the abdomen, in the axillæ and groins, once or twice daily. Its odor is the principal objection to this method, but the results are extremely satisfying in many cases.

GROUP VII.

Agents Acting Upon the Genito-Urinary Organs.

CHAPTER I.

BUCHU.
UVA URSI.
TRITICUM.
EPIGÆA.

ALTHEA.
ERYNGIUM.
GALIUM.
PETROSELINUM.

BUCHU.

BAROSMA

{ BETULINA.
 CRENULATA.
 SERRATIFOLIA.

Part Employed—The leaves.

Natural Order—Rutaceæ.

Locality—South Africa.

Botanical Description—The three plants from which the buchu leaves of commerce are derived are shrubs which attain a height of three or four feet, with stiff, angular branches and purple bark; the young twigs having immersed oil glands; leaves opposite, nearly sessile; flowers pink, or whitish; calyx deeply five-lobed; petals longer than the calyx; stamens five, hypogynous, alternating with the pistils; fruit five carpels, united at the inner margin and dehiscent above; each containing one smooth, black, shining seed.

The *Barosma Betulina* and *Barosma Crenulata* supply the short buchu leaves of commerce, while the long buchu is derived from the *Barosma Serratifolia*. The leaves of the former are about three-fourths of an inch long, and obovate, while the leaves of the latter are about an inch and a half long and lance-linear in shape. The officinal buchu leaves are described as follows: "About fifteen mm. long, roundish obovate, with a rather wedge-shaped base, or varying between oval and obovate, obtuse, crenate or serrate, with a gland at the base of each tooth; dull yellowish-green, thickish, pellucid, punctate; odor and taste strongly aromatic, somewhat mint-like, pungent and bitterish." Solvents, alcohol, water partially. Dose, from twenty to thirty grains.

CONSTITUENTS—Volatile oil, rutin, resin, gum, albumen.

PREPARATIONS—*Extractum Buchu Fluidum*, *Fluid Extract of Buchu*. Dose, from ten to sixty minims.

Therapy—The agent acts directly upon the **urinary apparatus**, stimulating the kidneys, and increasing both the watery and solid constituents by its tonic and restorative influence. It is

also valuable when there is greatly increased action from debility, as it lessens the quantity of water secreted in such cases. It relieves irritation of the bladder and urethra, and is valuable in **catarrh** of the **bladder**, **pyelitis** and **gonorrhœa**. In chronic cases of **irritable bladder** it has long been used, especially if caused by persistent excess of **uric acid**. It controls the irritation, reduces the excess of acid, and relieves the urinary incontinence depending upon it. It relieves irritation of the bladder sphincter, increases the tone of the muscular structure and overcomes any existing paralysis.

It has been advised as a general tonic, a stomachic and an anti-dyspeptic, but we would hardly depend upon it for any positive curative influence in these cases.

UVA URSI.

ARCTOSTAPHYLOS UVA URSI.

Synonym—Bearberry.

Part Employed—The leaves.

Natural Order—Ericaceæ.

Locality—United States, Europe.

Botanical Description—*Uva ursi* is a small, trailing, evergreen, perennial shrub, having a long, fibrous root, growing in sterile, gravelly or sandy soil, flowering from June to September, the berries ripening during the winter; stem woody, rooting, young branches rising obliquely upwards, much branched, smooth; leaves alternate, obovate, or oblong-spatulate, four-fifths of an inch long, one-fourth to one-half inch wide, short petioled, entire, slightly revolute margin, coriaceous, in young ones pubescent, dark-green and glossy above, with depressed veins, paler with reticulated veins beneath; odor hay-like; taste astringent, bitter. Solvents, alcohol, water. Dose, from fifteen to sixty grains. The green leaves, only, should be gathered in autumn and dried by exposure to a moderate heat.

CONSTITUENTS—Gallic acid, tannin, resin, sugar, arbutin, ericalin.

PREPARATIONS—*Extractum uvæ ursi fluidum*, fluid extract of *uva ursi*. Dose, from ten to sixty minims.

Physiological Action—*Uva ursi* has long been in general use as a diuretic and sedative to the general urinary apparatus. It exercises both an astringent and tonic influence also, and it is prescribed when there are calculi present.

Specific Symptomatology—Its direct influence is upon relaxed conditions of the bladder walls, to which it imparts tone and induces normal contraction. It restrains excessive mucous discharges.

Therapy—It is curative in **ulceration** of the **bladder** wall, in **cystitis**, in **pyelitis** and in **pyelonephritis**. It is of much

benefit also in the general treatment of **gonorrhœa**. It has been prescribed with much confidence in **diabetes**, in which condition its influence is more general than specific. It exercises a soothing influence upon the urinary apparatus, and, for that reason, is a common constituent of very many prescriptions for diseased conditions of this apparatus.

TRITICUM.

TRITICUM REPENS. AGRAPHYRUM REPENS.

Synonym—Couch grass.

Part Employed—Rhizome gathered in the spring and deprived of the roots.

Natural Order—Graminaceæ.

Locality—Europe, North America.

Botanical Description—Couch grass is a perennial plant with a very long jointed, whitish, underground stem, or rhizome, with a tuft of fibrous roots at each joint; culm two to four feet high; spikes compressed, three to four inches long, spikelets three, many flowered; florets mostly awnless, half the length of the flower; leaves flat, rough.

Couch grass of commerce is found cut into pieces one-fifth of an inch in length and one-twelfth of an inch in diameter, straw-yellow, hollow, smooth, inodorous, sweetish. Solvents, water, alcohol.

CONSTITUENTS—Triticin, silica, glucose, inosite, mucilage.

PREPARATIONS—Specific triticum. Dose, from one to sixty minims.

Physiological Action—The action of this agent is solely upon the **urinary apparatus**. It exercises a soothing, diuretic influence, greatly increasing the flow of the watery portion of the urine without to the same extent influencing the actual renal secretion. It is bland, mild, unirritating, and is used whenever urine, having a high specific gravity, causes irritation of the kidneys or bladder, more especially of their mucous surfaces.

Therapy—It is a useful agent in **pyelitis** and in **catarrhal** and **purulent cystitis**. It is of value also because of its soothing properties in **gonorrhœa**. In the treatment of **lithæmia**, it will relieve the constant ache in the back, which is due to precipitation of the crystalline secreted products within the tubules of the kidneys, by furnishing abundant water for their solution. It flushes the kidneys, as it were, to an admirable extent, when renal sand has accumulated within the pelvis. Under these circumstances it is one of our most useful remedies. Whether the deposit consists of phosphates, uric acid, or the salts of calcium, it seems to act equally well. It relieves **dysuria** and **tenesmus** and has been beneficial in the treatment of both sub-

acute and chronic **prostatitis** with enlargement, **stranguary** and **hæmaturia**.

In gout, chronic **rheumatism** and jaundice with the above complications, it is of much value as an eliminant. One of our authorities speaks of it as a drink in fevers. The infusion may be iced, or given with lemon juice as lemonade.

It not only quiets the thirst, but it accomplishes the important purpose of keeping up free secretion from the kidneys. In the treatment of **fever** it is most important that the excretory functions should not be retarded and it is but seldom that sufficient attention is paid to the function of the kidneys. A free flow of urine is often a most effectual sedative, materially assisting in the reduction of excessive temperature. There are but seldom, unpleasant effects observed from mild stimulation of the kidneys, under these circumstances. It assists in the elimination of heat, and waste products, and greatly lessens the danger of auto-intoxication, acting more effectually in many cases, than free evacuation of the bowels.

While the demulcent effect of this agent is not as great as that of other diuretics, its influence under the circumstances above named is often more satisfactory.

EPIGÆA.

Synonym—Trailing Arbutus.

Part Employed—The leaves.

Natural Order—Ericaceæ.

Locality—United States.

Botanical Description—*Epigæa Repens* is a trailing, hairy, shrubby plant of the heath family, growing in sandy woods and rocky soil, from Newfoundland to Kentucky, and flowering in April and May; stem thin, woody, six to twenty inches long, covered with a brown bark; leaves alternate, about two inches long by one and a half wide, petiolate, coriaceous, evergreen, reticulate; flowers fragrant, in small axillary clusters, rose-colored or whitish; corolla salver-shaped, cylindrical; calyx bracted, five-parted, stamens ten; anthers oblong, dehiscent by two longitudinal openings; capsule five-lobed, five celled, many seeded; leaves have a bitter, astringent taste. Solvents, alcohol, water. Dose, from fifteen to sixty grains.

CONSTITUENTS—Arbutin, urson, ericolin (identical with those found in *uva ursæ*), formic acid, gallic acid, tannin.

PREPARATIONS—*Extractum epigææ fluidum*, fluid extract of trailing arbutus. Dose, from thirty to sixty minims. *Specific Epigæa*. Dose, from five to thirty minims.

Specific Symptomatology—This agent should be freely employed where there is excess of uric acid; where the "brick-

EPIGÆA REPENS.

dust" deposit is marked; where the extreme and nauseating **backache** suggests that the crystalline constituents of the urine are not well dissolved and washed out of the tubules; or where there is renal sand or **gravel** in the **bladder**; where the urine is dark and heavy, and there is irritation, causing **congestion** of the **kidneys**, which in some cases induces **hemorrhage**; where precipitated solids irritate the bladder, and induce **cystitis** with thickening of the walls, and formation of pus. An infusion of epigæa freely drunk in these cases will relieve the entire train of symptoms, inducing a grateful sense of relief from irritation and distress.

Any of the preparations in sufficient doses will accomplish satisfactory results in the above conditions, but the infusion is more immediately active. Fifteen drops of specific epigæa in an ounce of hot water, drunk hot, will act most promptly.

ALTHÆA.

ALTHÆA OFFICINALIS.

Synonym—Marshmallow.

Part Employed—The root.

Natural Order—Malvaceæ.

Locality—Europe, United States.

Botanical Description.—Marshmallow is a perennial herbaceous plant, indigenous to Europe, but found growing in the United States and other countries; stem erect, woolly, branched, simple, round, leafy, from two to five feet high; leaves alternate, cordate below, ovate-oblong above, serrate, five-lobed, downy; flowers in terminal and axillary panicles, bluish; corolla five-limbed; petals obcordate; fruit capsules arranged in a circle, each containing a single seed; root, which should be collected in autumn from plants two years old, is perpendicular, branching; as found in the shops it is in cylindrical or tapering pieces, three to eight inches long, half an inch thick, deprived of rootlets and corky layer, white externally, yellowish internally, hairy from loosened bast fibres; fracture short, granular, fibrous only in the cortical portion; odor faint, aromatic; taste sweetish, mucilaginous. Solvent, water. Dose, from a half to one dram.

CONSTITUENTS—Asparagin, mucilage, pectin, fixed oil, sugar, starch, salts.

PREPARATIONS—Syrupus Althææ. Syrup of Althæa. Dose, *ad libitum*.

Physiological Action—Althæa is the most mucilaginous of the **diuretics**. It has but little influence beyond its local, soothing, emollient effect; it also soothes **irritation** in the **mucous membranes** of the stomach and intestinal canal, as well as those of the entire urinary apparatus.

Therapy—In its soothing influence upon the intestinal struc-

tures, it is of service when there is **inflammation** of the **bowels** or irritation from any cause, and it is often administered as an enema in dysentery, and if a few drops of laudanum be added it will often cause prompt relief from the tenesmus and general distress. When **irritation** of the **bladder** exists from decomposed urine, this agent is of much service, especially if taken in conjunction with benzoic acid or benzoate of sodium. An infusion which contains five or six grains of the above salts to the ounce is of most excellent service in these cases. Acute painful **cystitis** with much mucus, ammoniacal urine, great pain in urinating, and tenesmus, should be relieved in twelve hours with this method.

In conditions where simple irritation is induced either from the presence of uric acid or other precipitated crystalline bodies, a strong infusion of althæa will greatly enhance the influence of other indicated remedies.

ERYNGIUM.

ERYNGIUM AQUATICUM.

Synonym—Button Snakeroot.

Part Employed—The rhizome.

Natural Order—Umbelliferæ.

Locality—United States.

Botanical Description—Button snakeroot, or water eryngo, is a perennial herb, with a tuberous root, growing in low, wet lands and pine barrens, and flowering in August; stem two to six feet high, branching, trichotomous above; leaves very long, those from the root sword-shaped, twelve to eighteen inches long, an inch to an inch and a half wide, those on the stem much shorter, parallel-veined, grass-like, ciliate, with bristly spines at distant intervals on their margin; bracts tipped with spines; flowers white, disposed in ovate heads, half an inch to an inch in diameter; fruit top-shaped; root-stalk one-fourth to one-half inch long, knotty, wrinkled longitudinally, dark-brown externally, with many fibres of the same color; internally yellow; taste sweetish, aromatic, pungent, bitter. Solvents, alcohol, water. Dose, from twenty to forty grains.

CONSTITUENT—Volatile oil.

PREPARATION—Specific Eryngium. Dose, from one to ten minims

Physiological Action—Diuretic, diaphoretic, expectorant, emetic.

Specific Symptomatology—Irritation of the bladder and urethra, dysuria, atonic dropsy, gravel, chronic nephritis, chronic bronchitis with profuse expectoration, chronic gonorrhœa, nymphomania and satyriasis, phthisis with profuse expectoration, chronic laryngitis, mucous diarrhœa and summer

complaint, epidemic influenza, scrofulous ophthalmia, hemorrhoids and prolapsus ani.

Therapy—*Eryngium* is a general stimulant, being diaphoretic and diuretic, with a special affinity for the mucous membranes. It has been given in infusion as a diaphoretic, in **dropsy**, **gravel** and **jaundice**, and in the commencing stage of catarrhal inflammation, such as occurs in the upper air passages in **epidemic influenza**. It must be given early in acute cases as a diaphoretic.

In chronic disease of the respiratory organs, with a relaxed condition of the mucous membranes, it acts as a stimulating expectorant like *senega*.

It is especially valuable in chronic irritation and inflammation of the mucous membranes; and on the urinary passages it has been shown to possess specific powers, as in **dysuria** from stricture, and in **gleet** and **chronic gonorrhœa**.

It also acts as a tonic upon the reproductive function, and is a very positive remedy in **nymphomania** and **satyriasis**.

It may be given as a tonic in cases of weak **digestion**, and to promote the appetite in general debility, and in convalescence from fevers.

GALIUM.

Synonym—Cleavers.

Part Employed—The herb.

Natural Order—Rubiaceæ.

Locality—Europe, United States.

Botanical Description—*Galium aparine* is an annual procumbent plant growing in cultivated grounds and along streams, flowering from June to September; stem weak, retrorse, prickly, three to six feet long, quadrangular, hairy at the joints; leaves in whorls of six or eight, linear-lanceolate, rough, prickly, mucronate, one or two inches long, two or three lines wide; flowers small, numerous, whitish, scattered, one or two on axillary peduncles; calyx four toothed; corolla rotate, four parted; stamens four, short; styles two; twin carpels, one-seeded, armed with hooked prickles; odor unpleasant; taste acrid, bitter, astringent. Solvents, alcohol, water. Dose, from one to two drams.

CONSTITUENTS—Gallotannic, citric and rubichloric acids; starch.

PREPARATIONS—Specific Galium. Dose, from five to sixty minims.

Therapy—A sedative remedy in acute inflammation or irritation of the urinary tract. Given in fever it impresses the temperature favorably, stimulates the excretion of all urinary constituents and the fever is shortened by its use. It is given for its general tonic influence upon the urinary tract.

GALIUM APARINE.

An infusion is the most active form. It is useful in **dysuria** if from acute inflammation, and it is an excellent remedy for **suppression** when **nephritis** has occurred from septic causes. It is useful in **stranguary** in vesical irritation from **uterine** disorder and in the **cystic** and **prostatic irritation** of old men.

PETROSELINUM.**CARUM PETROSELINUM.**

Synonym—Parsley.

Part Employed—The root and seeds.

Natural Order—Umbelliferae.

Locality—Southern Europe.

Botanical Description—Parsley is an annual herb, indigenous to Europe but cultivated in our gardens for culinary purposes; stem erect, branching, striate, two to four feet high; leaves radical, cauline, tripinnate, bright-green, petiolate; leaflets smooth, three-lobed, deeply incised, wedge-shaped at the base; flowers small, pale-yellow, arranged in terminal compound umbels, with one or two leaved involucre and partial ones with six or eight leaflets; pistils five, rounded, incurved; fruit ovate, one-twelfth of an inch long, greenish-brown; mericarp with five ribs, six oil tubes; root fleshy, spindle-shaped, six to eight inches long, half an inch thick; when dry, yellowish-brown, annulate above, longitudinally wrinkled below; fracture short, mealy, with brown resin cells scattered in the bark and medullary rays; odor agreeable; taste spicy. Solvents, alcohol, water. Dose, from a half to one dram.

CONSTITUENTS—Apiin, apiol, volatile oil, crystallizable and fatty matter.

Apiol—This is a yellowish, oily liquid, not volatile, heavier than water, odor peculiar and distinct from that of the plant, taste acrid, pungent. Dose, from five to ten drops.

PREPARATIONS—Infusum Petroselini. Infusion of Parsley. Dose, from two to four ounces.

Therapy—An infusion of parsley is beneficial when, with **nephritis** or **cystitis**, the specific gravity of the urine is high, and the urination painful and irritating to the mucous membranes. It is useful in **gonorrhœa** and stranguary, with great irritation of the parts, with heat, or a scalding sensation on passage of urine, and can be given during the inflammatory stage. It has also been given in **dropsy** with good results.

Apiol is a specific in **amenorrhœa**. Five or six minims in a capsule, three times daily, for six or eight days before the menstrual epoch will restore the flow in many stubborn cases. It has no marked abortive influence. In **persistent dysmenorrhœa** it has cured many cases intractable to other agents.

Active anti-periodic properties have been ascribed to apiol.

It is a nerve stimulant. It controls excessive night sweats, either from phthisis, or following protracted malarial disease.

CHAPTER II.

STIGMATA MAIDIS.

SCOPARIUS.

EUPATORIUM PURPUREUM.

CUCURBITA CITRULLUS.

SPIRIT OF NITROUS ETHER.

EQUISETUM.

MAIZE.

STIGMATA MAIDIS.

Synonym—Corn silk.

Part Employed—The green pistils or stigmata.

Natural Order—Gramineæ.

Location—Throughout the temperate zones.

Botanical Description—The common field corn is an annual plant with a tall, erect, stiff stem, four to ten feet high, solid, not branched, with a spongy central portion; smooth, striate; leaves large, numerous, placed closely; sheaths wide, smooth, striate, auriculate, covering the stem, with a tuft of hair at the apex; ligule membranous, short, laciniate, blade one and one-half feet long, spreading, linear-lanceolate, acute, smooth on both surfaces with a strong prominent midrib. Flowers unisexual. Fruit roundish, reniform, compressed, three-eighths inch wide, varying, smooth, shining, bright yellow, laxly surrounded at the base by the withered glumes and pales; densely packed in vertical rows on the axis and forming a cylindrical, oblong, blunt spike, surrounded and acceded by the papery bracts.

PREPARATIONS—A fluid extract from the ear terminals of the common field corn prepared when yet green. Dose, from one to two drams.

Specific Stigmata Maidis. Dose, from twenty drops to two drams, in water.

Therapy—The agent is a diuretic and demulcent. It apparently has antiseptic properties, due probably to the presence of maizenic acid which has a desirable influence in neutralizing excessive alkalinity of the urine, and in the cure of phosphatic gravel.

It is of value in **catarrhal cystitis**, soothing, and neutralizing the strong ammoniacal odor, and decreasing the mucous secretion. In **lithæmia** it increases the flow of water, and decreases the excessive proportions of uric acid and the urates. It is specific in relieving **bladder irritation** in these cases.

In painful urination from any cause, it is beneficial, and is a good auxiliary in the treatment of **gonorrhœa**. It influences all **catarrhal** conditions of the **urinary passages**.

Dupont advised its use in **dropsies** due to heart disease. He says it reduces the **œdema**, and as the œdema disappears there is a better regulation of the blood supply throughout the system; the pulse beats more regularly, the action of the heart is slower and the rhythm is improved. While this fact is true, there is not much improvement in dyspnœa, nor in the actual condition of the heart when hypertrophy, contraction, or inefficiency are present. The agent is well tolerated by all patients.

Dr. Pruitt of Arkansas in 1893 reported the use of a distilled extract of **corn husks** in the treatment of **malaria**. He had observed its use in many cases of chronic intermittent fever. In no case had he known it to fail in giving relief to the entire train of symptoms, often intractable to other remedies. It controls the persistent temperature, quiets irritability of the stomach, regulates the action of the liver and kidneys and reduces enlarged spleen. It has a mild, diuretic effect in many cases, relieving dropsical conditions not dependent upon actual kidney lesion.

SCOPARIUS.

Synonym—Broom.

Part Employed—The tops.

Natural Order—Leguminosæ.

Locality—Europe, Asia.

Botanical Description—*Cytisus scoparius* is a shrub, about three to eight feet high, growing in sandy soil and flowering in May and June; stem one to three inches thick; with many pentangular, green, smooth, tough, wand-like branches; leaves small, oblong, downy, deciduous, scattered, petiolated; flowers numerous, golden-yellow, butterfly-shaped, large, in racemes on short, axillary peduncles, legume compressed, dark-brown, hairy at the suture, one and a half inches long, one-fourth inch wide, containing about sixteen seeds; tops in thin, flexible, branched twigs, pentangular, winged, dark-green, nearly smooth, tough, usually free from leaves; odor peculiar when bruised; taste disagreeably bitter, (U. S.) Solvents, alcohol, water. Dose, from fifteen to thirty grains.

CONSTITUENTS—Scoparin, sparteine, volatile oil, fatty matter, wax, tannin, mucilage, albumen, sugar.

PREPARATIONS—*Extractum Scoparii Fluidum*, Fluid Extract of *Scoparius*. Dose, from twenty to forty grains.

Physiological Action—Poisonous doses of sparteine cause sweating, vomiting, dimness of vision, staggering gait, dizziness, a sense of weight in the limbs, slowing of the pulse, convulsions, paralysis of the motor and respiratory centers, and death by asphyxia. The preparations of *scoparius* are non-toxic.

Administration—The best form of the remedy is an infusion,

CYTISUS SCOPARIUS.

half an ounce of broom tops to half a pint of boiling water, to be taken in divided doses in twenty-four hours, till it acts on the kidneys or moves the bowels.

Therapy—**Asthenic dropsies, dropsy** with feebleness and loss of appetite, **hydrothorax** without inflammation, dropsy from heart disease.

It should not be given in acute kidney troubles, or in dropsy from disease of the liver or spleen.

EUPATORIUM.

EUPATORIUM PURPUREUM.

Synonyms—Queen of the Meadows, Gravel Root.

Part Employed—The root.

Natural Order—Compositæ.

Locality—United States

Botanical Description—*Eupatorium Purpureum* is a herbaceous perennial plant, growing in low, dry woodlands; flowering in August and September; stem simple, three to twelve feet high, with or without purplish spots or dots, glabrous, green, with purple band at the joints—an inch wide; leaves oblong-ovate, very veiny, three to six in a whorl, about six inches apart, coarsely serrate, petiolate, eight to ten inches long, four to five inches wide, downy beneath; flowers purple to white, tubular, numerous, the florets arranged in a dense compound corymb; rhizome horizontal, with a woody head, and many long, dark-brown rootlets; odor hay-like; taste bitter, aromatic, astringent. Solvents, alcohol, water. Dose, from five to fifteen grains.

CONSTITUENTS—Eupatorin, resin, volatile salt, tannin.

PREPARATIONS—Specific Gravel Root. Dose, from five to thirty minims.

Specific Symptomatology—Irritation of the bladder in women from displacement and chronic inflammation of the uterus; and **suppression** of urine, partial or complete, during or after pregnancy.

Therapy—The agent is of service in **dropsy, strangury, gravel, hæmaturia**, disease of the **kidneys** and **bladder** from an excess of uric acid, also in chronic **endometritis**, leucorrhœa, chronic uterine disease, insufficient labor pains, threatened abortion, ovarian and uterine atony, dysmenorrhœa, painful affections of the kidneys and bladder, much cutting pain and smarting in the urethra while urinating, constant desire to urinate, supression of urine, either partial or complete. burning distress or dull aching in the bladder, urine mixed with mucus, pain in the kidneys. It has been frequently used in enormous distention of the limbs and body from **dropsy**. Also in **intermittent fever**, chills in the lumbar region, when there is violent shaking with little perspiration, severe bone pains, frontal headache,

weak, tired feeling, paroxysms every other day, hectic fever with night sweats.

Eupatorium Purpureum is a remedy for the diseases of the **uric acid diathesis**, irritation of the urinary tract being the chief symptom; while it is a positive remedy where it is necessary to increase the flow of the urine. It increases retrograde metamorphosis and eliminates the poison causing rheumatism. It stimulates the female reproductive organs, and may be employed in labor and as a tonic in chronic uterine disease. In intermittent fever it has effected cures. It acts on the ganglionic system of nerves, and may be given to improve digestion. It stimulates waste, and may be employed in any case where an alterative is required.

CUCURBITA.

CUCURBITA CITRULLUS.

Synonym—Watermelon.

Part Employed—The seeds.

Natural Order—Cucurbitaceæ.

Locality—Africa, cultivated in the United States and other countries.

Botanical Description—The watermelon is an annual plant, with a prostrate, slender, hairy stem and branching tendrils; leaves palmately five-lobed, the divisions again lobed or sinuate-pinnatifid, with obtuse segments, pale or bluish, glaucous beneath; flowers yellow, solitary, on hairy peduncles, bracted at the base; calyx five-toothed; corolla five-parted; staminate filaments three; pistillate three-cleft; style short; stigmas three, two-lobed; fruit oval, large, edible; seeds flat, ovate, half an inch long, usually black, smooth, compressed, thickened at the margin; taste bland. Solvent, alcohol. Dose, one ounce.

CONSTITUENTS—Fixed oil, mucilage, sugar.

PREPARATION—Fluid Extract of Watermelon Seed. Dose, one dram.

Therapy—The juice of the fruit is a **diuretic** with many individuals, producing a cooling sense of relief from heat or **aching** across the kidneys, or throughout the **urinary apparatus**. The seeds in the form of an infusion act promptly with children, relieving **pain** in the **passage** of **urine** and stimulating the flow of water. When male infants cry with every urination and the diaper is stained yellow, this remedy will correct the condition promptly. In those conditions accompanied with a general sense of constriction, or **backache** from the passage of urates and phosphatic gravel, this remedy exercises a direct soothing influence, not only upon the renal organs, but upon the **bladder**, especially when the **irritation** persists, warding off subsequent **inflammation**. It is also very useful during the active stage of **cystitis**.

SPIRITUS ÆTHERIS NITROSI.

Synonyms—Spirit of nitrous ether. Spiritus nitri dulcis. Sweet spirit of nitre.

Occurrence—This may be made by the distillation of sodium nitrite, sodium carbonate, potassium carbonate, sulphuric acid and alcohol in water. It is an alcoholic solution of ethyl nitrite.

Description—It is an inflammable liquid of a pale-yellow or greenish color; mobile, volatile, transparent, with a fragrant, ethereal odor and a sharp, pungent taste. It is neutral in reaction, and should be kept in small, dark glass, well stoppered bottles.

When aged and exposed, it assumes an acid reaction. It mixes freely with water and alcohol in all proportions.

Administration—The dose of this remedy is from ten drops to one dram, freely diluted with water. In childhood a small dose frequently repeated will be more satisfactory.

Therapy—This agent is an **anæsthetic** although not used for that purpose. Its common use is that of a **stimulating diuretic** and if the conditions are favorable, it will produce the discharge of a very large quantity of water. It is the domestic remedy for retention or **suppression of urine** in children. If it is given with hot tea or with watermelon seed tea, it is of value in mild dropsies. If the glands of the skin are active, the skin being warm and moist, its diaphoretic influence may be greater than its diuretic effects. The agent is antispasmodic and stimulant in **continued fevers** with much prostration and nervous irritability. It may be given in fifteen or twenty drop doses four times a day in water with very good results. It soothes the irritation, reduces the temperature and encourages elimination.

It is a remedy for **nervous irritation** of the **stomach** with nausea and flatulence.

Its diuretic influence is of advantage in certain forms of **Bright's disease**, if there is congestion with deficiency of urinary secretion. It is of temporary benefit only and its use cannot be greatly prolonged.

It will relieve **pain in urination** in many cases, especially if there is an alkaline reaction to the urine. It is of value in urethral spasm and in some forms of spasmodic stricture.

Pain on urination in childhood in the larger proportion of cases will be benefited by its use.

EQUISETUM.

EQUISETUM HYEMALE.

Synonym—Scouring rush.

Part Employed—The whole plant.

Natural Order—Equisetaceæ.

Locality—United States, Europe.

Botanical Description—Scouring rush is a perennial cryptogamous or flowerless plant, propagating by spores instead of seeds, and is found growing in damp soil, attaining a height from two to three feet, and maturing in June and July; stem simple, erect, jointed, hollow, twelve-furrowed, bearing a terminal ovoid spike; cuticle often containing silex; each joint closed at the lower end, and bearing at the upper a tubular sheath, which encloses the base of the next joint, and is split into as many narrow teeth as there are ridges in the stem; spores minute, each with four club-shaped threads, which are coiled about the spore when moist, but uncoil suddenly when dried. (Gray). Solvents, alcohol, water. Dose, from five to sixty grains.

CONSTITUENTS—Silex, resin, wax, sugar, starch, salts, fixed oil.

PREPARATION—Specific Equisetum. Dose, from five to thirty minims.

Therapy—A diuretic useful in suppression of urine from any cause. Useful in **dropsy** and in **lithæmic conditions**, where the urine is scanty, of high specific gravity, and dark-colored. It is advised in **hæmaturia**, and is of much service in both **gonorrhœa** and **gleet**. In cases of **irritable bladder** with much tenesmus, it is soothing in its influence. It is valuable in the treatment of nocturnal **incontinence** of **urine** in children, and in incontinence induced by cystic irritation.

An infusion made from the green stalks of the plant, is sometimes of more service than other forms, a fact which is true of a large number of diuretics.

Some authorities have advised the powdered ashes of this agent in the treatment of certain forms of **acid dyspepsia**. This influence is probably due to the presence of the potassium or sodium hydrate, or their compounds, in these ashes, and these substances are readily supplied from more available sources.

CHAPTER III.

JUNIPER.
KAVA-KAVA.
HYDRANGÆA.
PICHU.
XANTHIUM.

BENZOIC ACID.
SODIUM BENZOATE.
LITHIUM BENZOATE.
AMMONIUM BENZOATE.
PIPERAZINE.

JUNIPER.

JUNIPERUS COMMUNIS.

Synonym—Juniper berries.

Part Employed—The fruit.

Natural Order—Coniferæ.

Locality—Europe.

Botanical Description—Juniper is indigenous to the northern hemisphere, growing in sterile and rocky ground, and flowering in May. It is an evergreen shrub, six to fifteen feet high, with numerous very close branches, erect or spreading; leaves acerose, in whorls of threes, channelled, persistent, deep-green, shining, mucronate, entire, glaucous above, resupinate; flowers dioecious, the staminate ones in catkins, the pistillate ones in cones; after fructification the scales of the latter enlarge and become fleshy, inclosing the fruit, which is a roundish berry the size of a pea, dark-purple beneath the glaucous coating, pulpy, with one to three long, angular seeds, with many oil sacks in their surface; ripens the second year; odor and taste terebinthinate. Solvents, alcohol, hot water. Dose, from one to two drams.

CONSTITUENTS—Volatile oil, resin, gum, wax, starch, sugar, salts.

PREPARATIONS—Extractum Juniperi Fluidum. Fluid Extract of Juniper. Dose, from one to two drams. Oleum Juniperi. Oil of Juniper. This is a volatile oil obtained from juniper berries by distillation, and is of a pale-greenish or yellowish color, and of a warm, terebinthinate taste. Dose, from five to twenty minims.

Oleum Cadinum—Oil of Cade. This is an empyreumatic oil obtained from the wood of Juniperus Oxycedrus, a shrub resembling common juniper, by dry distillation, and is a dark-colored, thick liquid with a tarry odor, and a burning, bitter taste. Dose, from three to five drops.

Therapy—Juniper has long been in use as a general diuretic and soothing kidney remedy. It is indicated in feeble or aged patients with persistent dragging or weight across the kidneys. In chronic disease it is especially beneficial. In **pyelitis**, **pyelonephritis** and **cystitis**, all of a chronic form, it is of value.

It will quickly relieve many cases of simple **renal hyperæmia**, preventing the development of structural change, or the advancement of nephritis. After acute **nephritis**, whether from

direct causes, or subsequent to scarlet fever, diphtheria, or other severe disease, when active inflammation has subsided, it will restore the secretory power of the epithelium of the renal tubules and readjust the secretory function to the blood pressure, restoring normal action. It is useful in strangury, and in some dropsies where there is absence of acute inflammation.

The oil of cade is applicable to skin diseases, especially **moist eczema**. It may be applied directly, but is quite severe upon an irritable or sensitive surface. It can be incorporated with an ointment base to excellent advantage. It is a useful agent in **psoriasis**, and as a parasiticide it will destroy psora and cure favus.

It was at one time in common use as an application to skin diseases and parasites in domestic animals.

KAVA-KAVA.

PIPER METHYSTICUM.

Synonyms—Yakona, Ava Ava, Ava Kava, Kawa, Macropiper methysticum.

Part Employed—The rhizome, the roots, and the extreme base of the stems.

Natural Order—Piperaceæ.

Locality—Hawaii, and the South Sea islands.

Active principles: Kawahin, a crystalline principle; a resin containing the active principle.

Botanical Description—The Kava-Kava plant is known by different names in different islands; in Tahiti as Ava Ava, in Hawaii as Kawa, and in the Marquesas as Kava or Kava-Kava. Besides being found wild, it is cultivated in many of the islands of the Pacific ocean. Several varieties are distinguished by the natives.

The *piper methysticum* is a dioecious shrub from three to six feet high, in general character similar to the bamboo, with stems varying from one to one and one-half inches in thickness. The membranaceous leaves are rather large, varying in size from four to eight inches in length, and are nearly as broad as they are long. In shape there are nearly cordate at the base, tapering above somewhat suddenly into a very short acuminate apex; the leaves are alternate and stalked, the petiole being usually from one to one and one-half inches long and dilated towards the base; there are usually ten to twelve principal veins of the leaf radiating from the top of the petiole, the three central veins being very close together for about one-half inch upwards from the base of the leaf. The staminate aments are short, about two to two and one-half inches long, including a peduncle of four to six lines, solitary, densely flowered, and opposite the base of the petioles. The root is large, fibrous,

light and spongy in texture, externally of a greyish-brown color; when fresh it weighs from two to four pounds. In drying it loses rather more than half of its weight; internally the root is of a yellow whitish color. It has a slightly pungent taste; the root has a pleasant odor resembling that of the lilac; it causes an increase of the flow of the saliva, with an astringent sensation in the mouth and a scarcely perceptible bitterness.

CONSTITUENTS—An active resin, or two resins of similar character, and a yellow, volatile oil. The resinous principle is permanent and probably contains the active principle of the plant.

PREPARATIONS—Extractum Kava-Kava Fluidum. Fluid extract of Kava-Kava. Not miscible with water. Dose, from ten to sixty minims.

Solid extract of Kava Kava, one part equals ten of the root; dose, from two to six grains.

Specific Kava-Kava. Dose, from five to twenty minims.

Physiological Action—In its native habitat there is prepared from the root of the Kava the natural beverage of the natives, —a most popular drink which is prepared by first triturating or chewing the root. The chewing is done by young maidens or boys, and the masticated portions are macerated with water in a wooden bowl and strained. The drink produces a mild species of intoxication of a peculiar character, not quarrelsome, but inducing a lassitude, a placid tranquillity with incoherent dreams.

Taken in the form of the fluid extract it produces a sensation of pungent burning or intense warmth in the mouth, followed by numbness. It slows but increases the strength of the heart action, raises the blood pressure at first but subsequently lowers it, abolishes reflex action and finally paralyzes the spinal cord and the respiratory centers.

Locally it is an anæsthetic of much power. The anæsthesia is persistent and is exercised actively upon the conjunctiva. It contracts the capillaries, producing local anæmia.

It is a powerful sudorific, and its influence upon the skin is so great as to produce elephantiasis in some cases. In milder cases various skin diseases result, with disordered eyesight.

Dr. David Cerna made extensive experiments upon the action of the drug, which were published in *The Therapeutic Gazette* in January, 1891. His conclusions were as follows:

Kava-kava produces general anæsthesia, and is especially a powerful anæsthetic.

The drug diminishes, and finally destroys, the function of the afferent nerves, by affecting their peripheral ends.

Kava-kava diminishes, and eventually abolishes, reflex action, by influencing the spinal cord, and probably also the sensory nerves. The paralysis produced by kava-kava is of spinal origin, and is due to direct action upon the cord.

Kava-kava, while increasing the force of the heart, dimin-

ishes the number of pulsations, by stimulating the cardio-inhibitory centers and ganglia, chiefly the former.

The drug lowers arterial pressure through an action upon the vagi. It afterwards elevates it however, especially after previous division of the pneumogastrics, by a direct action on the heart.

Kava-kava at first stimulates, afterwards depresses, and finally paralyzes, the respiration. The primary stimulation is due to excitation of the pulmonary peripheries of the vagi; the latter effect, to an influence exercised on the respiratory centers of the medulla oblongata.

Kava-kava, in small doses, increases slightly, and in large quantities diminishes the bodily temperature.

The drug increases notably the salivary secretion.

Specific Symptomatology—Its specific therapeutic value depends upon its influence upon the mucous membranes of the genito-urinary apparatus. It is profound in its influence upon these membranes, as it is probably eliminated by the kidneys to a certain extent unchanged. Its influence in reducing the quantity of blood in the capillary circulation is probably the cause of its action in reducing the inflammation in the mucous membranes of this apparatus. The writer has used it since 1882, and his experience confirms other enthusiastic reports. It will cure gleet where all other remedies have failed. It will cure chronic **gonorrhœa** more quickly and more satisfactorily than many other better known remedies.

Therapy—The agent is advised in the treatment of all forms of **gonorrhœa**, but it will probably give better satisfaction, will show its prompt influence to a better advantage in the treatment of sub-acute forms or in the slow, persistent, and otherwise intractable forms, than in the acute variety. It is best given in full doses of from fifteen to thirty minims every two or three hours, in cold water. In the old, protracted gleet cases there will usually be no necessity of an injection or auxiliary treatment, but in the more acute or sub-acute cases, a mild injection or irrigation is needed, which with auxiliary agents, such as gelsemium or cimicifuga, to act upon the fever and nerve elements of the disease, will greatly facilitate its action. It increases the tone and power of the sexual and urinary apparatus, and improves the general health and vigor of the patient. It is a mild but efficient diuretic, stimulating both the excretion and the secretion of the urinary constituents. It is of much value in **catarrh** of the **bladder**, in old and enfeebled cases relieving the symptoms promptly, in some cases restoring the strength and tone of the urinary organs. It relieves painful urination, overcomes strangury, and increases the power to expel the urine. In the **nocturnal enuresis** of the aged and feeble, and in children from temporary muscular weakness, it

is a most satisfactory remedy, curing often when other remedies fail. It acts in perfect harmony with belladonna and strychnine in such cases.

Its diuretic influence has rendered it an important remedy in many cases of **dropsy**, the entire train of symptoms being quickly and satisfactorily relieved with its use. In those cases where the heart seems feeble and irregular in its action, its power and strength has increased and a cure resulted.

It **increases** the **appetite** actively, and improves digestion and assimilation to a satisfactory extent with a large percentage of the patients taking it, and may be given for this purpose in gastric atonicity. In some cases, in which the author has prescribed it, the agent has induced an almost inordinate appetite. It stimulates the entire function of digestion, in certain cases, to a satisfactory degree, correcting torpidity and functional inactivity of the glandular organs of the entire intestinal tract, increasing the peristaltic action of the intestines, overcoming constipation, and inducing normal and satisfactory bowel movement. It will be found a good auxiliary remedy in the treatment of **hemorrhoids**, and especially in chronic **intestinal catarrh**.

HYDRANGÆA.

HYDRANGÆA ARBORESCENS.

Synonyms—Wild Hydrangæa, seven barks.

Part Employed—The root.

Locality—United States.

Botanical Description—A smooth, indigenous shrub, five or six feet high; leaves opposite, petiolate, ovate, rarely cordate, acuminate, serrate-dentate, green on both sides; flowers often all fertile, numerous, small, white, disposed in fastigate cymes; calyx tube hemispherical, coherent with ovary; stamens eight or ten, slender; seeds numerous.

PREPARATION—Extractum Hydrangææ Fluidum. Fluid Extract of Hydrangæa. Dose, from ten to thirty minims.

Specific Hydrangæa—Dose, from five to thirty minims. Thirty minims in two ounces of water, a teaspoonful every ten or fifteen minutes, will quickly relieve acute, quick, cutting, urethral pains, especially immediately after labor.

Specific Symptomatology—Frequent urination with heat, burning, accompanied with quick, sharp, acute pains in the urethra; partial suppression of urine with general irritation and aching or pain in the back, pain from the passage of renal sand, are direct indications for this agent.

Therapy—This agent is a soothing diuretic, exercising a mild, but permanent tonic influence upon the entire mucous structures of the genito-urinary apparatus. It is an important

remedy in **acute nephritis**. The writer has for many years combined it with gelsemium, or gelsemium and cimicifuga, and has obtained most satisfactory results. In **lithæmia** with permanent **backache** from the kidneys, irritation from the presence of uric acid and phosphatic crystalline substances, the continued use of this agent is usually curative. In **urinary irritation** of an acute character, or that induced by local causes, as that following confinement, this agent is often curative in a few hours. Any excess of acidity or alkalinity, however, should be corrected by other agents.

About the year 1830 experiments were conducted to prove its influence in relieving pain caused by the presence and passage of urinary calculi, and most favorable reports were made of its direct usefulness. Its influence controlled the pain in a satisfactory manner, relieved general distress, and soothed irritation. Enthusiasts claimed that it dissolved the stone in the bladder.

Infusions, in some cases, are more satisfactory than exact pharmaceutical preparations. The fluid extract in hot water is often more prompt in its action. The agent is soothing, also, to the mucous surfaces of the respiratory passages.

PICHI.

FABIANA IMBRICATA.

Part Employed—The leaves.

Natural Order—Solanaceæ.

Location—South America.

Botanical Description—The plant grows upon dry hillsides usually quite barren of other vegetation; a small shrub with plume-like sprays much resembling the pine, in many particulars, yet belonging to the same order as belladonna duboisia and tobacco. The entire shrub is covered with a bluish or greenish-gray resin which is exceedingly abundant and is found within the woody structure of the shrub. The calyx is free, closely investing the ovary, the corolla is white, persistent, borne with the ovary on an orange-colored disk four times the length of the calyx. Stamens five, unequal, anthers short, two-celled, pistil bicarpillary, style slender, fruit oblong-ovoid, light-brown; seeds four, one-half line long, flattened, brown.

CONSTITUENTS—A fluorescent glucoside, crystalline; a crystalline neutral resin, pavien, fraxin and an essential oil.

PREPARATIONS—Extractum Pichi, Extract of Pichi. Dose, from two to ten grains.

Extractum Pichi Fluidum. Fluid extract of Pichi. Dose, from ten to sixty minims.

Administration—This agent being a terebinthinate and markedly resinous in character, readily precipitates in water,

the precipitate separating in masses or curds. The solid or powdered extract may be given in capsules. The fluid extract may be prescribed in glycerine without precipitation. It should not be combined with saline constituents. It will remain in temporary suspension in a heavy syrup, or mucilage.

Specific Symptomatology—The agent has specific properties in relieving **irritation** and **inflammation** of the **bladder** due to mechanical causes. In **gravel**, especially of the uric acid variety, it is prompt and satisfactory. In phosphatic or calcareous deposits, it is of great benefit.

It is a direct tonic to all mucous surfaces, soothing irritation and inhibiting excessive secretion.

Therapy—It relieves **general distress** or discomfort in all the urinary organs, and in the prostate gland. In **vesical tenesmus** and in **dysuria** from any cause it is almost specific. In **lithæmia** or the uric acid diathesis, it stimulates the liver to more perfect action, greatly increases the action of the kidneys, reduces the specific gravity of the urine, and permanently reduces the excess of uric acid. This influence renders it of value in **rheumatism**, either acute or chronic.

It has been used in **gonorrhœa** and in acute and **chronic cystitis** of all forms with excellent results. It acts as a gastric tonic, like kava-kava, greatly increasing the appetite and promoting digestion. It has a direct action upon the function of the liver.

It stimulates the kidneys, too actively in those cases where there is structural degeneration, but it will quickly overcome simple recent cases of **renal hyperæmia**. It is contra-indicated in Bright's disease.

XANTHIUM.

XANTHIUM SPINOSUM.

Synonyms—Cocklebur, Clotbur.

Part Employed—The herb.

Locality—The United States, Europe.

Natural Order—Compositæ.

Botanical Description—A rather coarse, common plant, one foot high; stems branched, with slender triple spines at the base of the leaves, which are ovate-lanceolate, petiolate, cuneate at the base, usually dentate, veined, under surface grayish, oblong involucre, with slender spines; spines straw-colored, from three-fourths to one inch long; heads sessile in upper axils sterile; fertile in lower axils; blossoms late in the fall.

PREPARATIONS—Extractum Xanthii Fluidum. Dose, from ten to twenty minims.

Specific Xanthium. Dose, from five to fifteen minims.

Physiological Action—The agent has diuretic, mild diapho-

retic and salagogue properties. It is mentioned as a remedy influencing the blood in malarial conditions, tending to overcome periodicity. As an alterative some enthusiastic writers give it high rank, even claiming that it will cure hydrophobia. It is advised in hemorrhages of a passive character, to be relied upon even in post-partum hemorrhage. In the writer's hands it has an influence which would seem to be advantageous in **hæmaturia** of a passive character, as it has a soothing influence upon the urinary apparatus.

Therapy—Dr. Homsher suggested its use in irritable bladder troubles; specifically in **chronic cystitis**, with thickening of the bladder walls, with frequent urination, painful tenesmus, constant sensation of weight in the region of the bladder, with the continued passage of minute calculi, cases in which there are doubtless sand or gravelly deposits in the folds of the bladder, perhaps imbedded in the mucous structure, a condition not uncommon in females.

The writer, following these suggestions, advised it, combined with the tincture of red onion, in an exceedingly bad case with good results. Dr. Bloyer reports a case with a similar experience. It may repay extended investigation in this line. Whether the xanthium or the red onion were most active in the cases mentioned cannot, as yet, be stated, but the combination was of great service, where many other better known remedies had been used with no beneficial results. It should be tried in cystitis, both acute and chronic, in frequent urination with ammoniacal urine, where there is a great excess of mucus, and especially if the uric acid diathesis is present.

It is also suggested as a remedy in conditions of nervous excitement, accompanied with profuse sweating. In malarial conditions, or **intermittent fever**, in which its use is suggested, it is of especial benefit if the intermission is characterized by profuse and exhausting perspiration.

ACIDUM BENZOICUM.

Synonym—Benzoic Acid.

Occurrence—This organic acid (strictly speaking) is obtained either from benzoin, from sublimation, or it is obtained by synthetic processes from naphthalin or toluene. The German benzoic acid is prepared by separating the hippurate of calcium from the urine of cattle and horses and boiling it with hydrochloric acid.

Hippuric acid replaces, in herbivorous animals, the uric acid of carnivorous or omnivorous animals. It is a mild acid occurring from the decomposition of benzoic acid in the organism. The benzoic acid is supplied from the vegetable food of the

animals, occurring very largely in the coarse roots, and in gross vegetables, turnips, beets, carrots and parsnips, yielding a large quantity of the acid.

Description—Benzoic acid is a crystalline solid, without odor and of a warm, acrid, and slightly acid taste. It is sparingly soluble in cold water—one part to five hundred, and in fifteen parts of boiling water. In water it will volatilize freely upon the application of heat, and is thus useful as an inhalent. The dose is from five to fifteen grains.

Physiological Action—A solution taken into the stomach produces warmth and slight irritation. It is nontoxic, is decomposed in the presence of hippuric acid, is a germicide of considerable power and is antiseptic.

This acid acts directly in neutralizing alkalinity throughout the system, upon the urea in the processes of conversion of that substance into hippuric acid, robbing it of its nitrogen. There is thus a reduction of the amount of urea where this acid is administered in large quantity. If there is a lessened quantity of uric acid it is because of the appropriation of nitrogen by the benzoic acid, and not because of any solvent properties the agent has upon the uric acid.

Therapy—Its direct action is exercised upon the urinary apparatus. It is specifically indicated in conditions where the urine is alkaline, inducing **frequency of urination** with more or less irritation and pain and in **nocturnal enuresis**.

It is a good remedy in excessive excretion of the phosphates exhibited by phosphatic sediment—insoluble phosphates in the urine—a deposit of phosphatic gravel. Its influence is chemical and does not persist after the withdrawal of the agent. **Incontinence of urine** depending upon the irritation caused by the presence of this gravel is cured by it.

Incontinence in cases where the urine is excessively alkaline, from whatever cause, is quickly cured by it, as it is one of our best agents for the **neutralization of excessive alkalinity** of the urine. It has been used by the writer for nearly twenty-five years in the treatment of **cystitis** where there was **ammoniacal urine**. Its influence is prompt and satisfactory, rapidly promoting the processes of healing.

It is useful in **gonorrhœa** where the urine is alkaline, and in general **urethral irritation** from the presence of an excess of alkaline constituents. It is readily dissolved by the addition of sodium borate, decomposing the acid, but not interfering with, but rather enhancing the beneficial results of its action. It requires three parts of the borate of sodium to effectually dissolve two parts of the acid in thirty parts of water.

SODIUM BENZOATE.

Occurrence—This salt is produced by a chemical decomposition and interchange in the process of boiling together solutions of benzoic acid and sodium bi-carbonate.

Description—A permanent, amorphous white powder; odorless and of a sweet taste. Soluble in two parts of water and in forty-five parts of alcohol.

Therapy—Klebs, of Prague, originally advised this agent in **infectious fevers** and inflammations. It produced no unpleasant after effects and antagonized the causes of disease and the disease processes. Its antiseptic powers are sufficient to destroy many disease germs, and fevers so induced slowly subside. Direct antipyretic powers cannot be attributed to it.

It was at one time quite generally used in **diphtheria**, in **scarlet fever** and other **exanthematous** or **eruptive fevers**, and in **typhoid** and **malarial fevers** with much success. It is a good remedy in the treatment of **rheumatism**. It combats the processes, neutralizes the uric acid wherever found, hastens its excretion and abates the inflammatory fever. It promptly relieves irritation of the kidneys in these cases.

It is not as active as the salicylate of sodium, but is permanent in its influence and almost as efficacious, if persisted in.

It is of value in **catarrh** of the **bladder**, either acute or chronic, if the urine is strongly alkaline, or much mucus is present.

Its atomization and inhalation are beneficial in **catarrhal**, **bronchial** and **phthisical fetid discharges**, ameliorating, in each case, the progress of the disease while correcting the fetor. It was lauded in the treatment of consumption, but failed to accomplish but little. It is not now in as general use as it was twenty years ago.

LITHIUM BENZOATE.

Occurrence—Prepared by the decomposition of lithium carbonate with benzoic acid.

Description—The substance is a light, white powder, or it may occur as small shining crystalline scales, odorless, with a sweetish, cooling taste. It is permanent in the air, soluble in four parts of water, and in twelve parts of alcohol. Its solubility in water is increased by the presence of a small quantity of the sodium benzoate.

Therapy—The agent is accredited with the ability to **reduce** the amount of **uric acid** excreted in the urine, by the actual reduction of the quantity in the blood. It is said to retard, also, the formation of **hepatic calculi**, and to prevent the recurrence of **hepatic colic**. If this influence is present it is probably due

to its action upon the secretory function of the liver. When urinary irritation is present with hepatic colic, both conditions will be benefited by the use of the remedy. **Cystic irritation** from the presence of renal sand is materially benefited by the use of this benzoate. Ammoniacal urine will be corrected by its influence.

AMMONIUM BENZOATE.

Occurrence—The Benzoate of Ammonium is formed by the union of a solution of ammonia and benzoic acid in distilled water.

Description—It occurs in thin, white, four-sided crystals without odor, and of a salty and slightly bitter taste. It is soluble in five parts of cold water, or in one and one-half parts of boiling water, and in twenty-eight parts of alcohol. Like the carbonate of ammonium, it can be completely dissipated by boiling.

Therapy—The benzoate of ammonium is principally used in **catarrh of the bladder**. It is given largely for the influence of the benzoic acid with which it is combined. It is especially indicated where there is alkaline urine. Because of the rapid elimination of the hippuric acid from the benzoic acid, and because of the fact that the ammonium salt is convertible into nitric acid within the system the elimination of these products neutralizes the alkalinity of the urine. It is useful in ammoniacal urine and in phosphaturia with precipitated earthy phosphates, also in excess of uric acid.

It stimulates the kidneys also in those conditions of the system in which there is general feebleness, resulting in deficient elimination, both of the solids and watery portion of the urine.

The agent is not injurious in its effects upon the system and is easily eliminated.

PIPERAZINE.

Formula— $C_4H_{10}N_2$

Synonyms—Piperazidine, Diethylendiamine.

Occurrence—This agent, not yet well known, is formed by the action of ammonia upon the bromide or chloride of ethyl.

Description—It is a lustrous crystalline body almost tasteless and odorless, fully soluble and very deliquescent, attracting CO_2 as well as water from the atmosphere.

Physiological Action—It has but little influence on the circulation or temperature even in very large doses, neither are there marked effects observable in any of the vital processes. It does not disarrange the stomach or irritate the bowels.

One observer, however, (Vanderklip) claims that in lower animals the agent in full doses induces nausea, loss of muscular power, and irregular respiration, and that it decreases the coagulability of the blood. Stewart observed tremors and hallucinations, which he attributed to this agent. The writer has given it for several years in medicinal doses and has observed no untoward effects. Its value is due to its activity in dissolving **uric acid**. In cold water it has twelve times as great a solvent power upon uric acid as the carbonate of lithium.

Administration—It absorbs water so rapidly and is so prone to decompose in solution that it should be prescribed in aqueous solution only and should be prepared fresh every two or three days. The crystals should be kept hermetically sealed in a cool place. Three grains every three hours, or five grains three times daily, is about the proper dose, given in a glass of water.

Specific Symptomatology—The agent is indicated where there is **persistent, excessive excretion** of uric acid and the urates with constant backache, dry skin and scanty urine, or where there is a brick dust sediment in the urine. It is a reliable agent in the **uric acid diathesis**.

Therapy—In the writer's experience when given in five grain doses in a large quantity of water, three times daily, to patients passing urine with a specific gravity of 1022 to 1028, which deposits a heavy brick dust precipitate as soon as cooled, with constant backache and general muscular aching, it will relieve the backache in one day, and reduce the specific gravity to 1018 or 1020 within a short time.

It acts more rapidly than other better known agents, and is direct and positive. It is soothing to the irritated passages, and prevents the formation of uric acid calculi. If given with a bland mucilaginous stimulating diuretic its general influence is greatly widened, and its solvent powers are increased correspondingly. The sickening ache across the kidneys terminates more promptly.

The agent has been quite widely used in the treatment of **chronic rheumatic arthritis**, and **gout**, and good results are ascribed to it. It has been applied in strong solution to the joints and injected into them with varying results in these conditions, usually with favorable results. It is useful in **acute rheumatism** and in **rheumatic pericarditis**, especially if there be excessive uric acid formation. Further experience will broaden its field of usefulness.

CHAPTER IV.

POLYTRICHUM.
APIS.

ARALIA.
ASCLEPIAS INCARNATA.
SAMBUCUS CANADENSIS.

SARSAPARILLA.
HYGROPHILIA.

POLYTRICHUM.**POLYTRICHUM JUNIPERIUM.**

Synonym—Hair-cap moss.

Part Employed—The whole plant.

Natural Order—Polytrichaceæ.

Locality—United States.

Botanical Description—Hair-cap moss is a perennial, ever-green plant, growing in high and dry places in poor sandy soil, and of a darker-green color than other mosses; stem leafy below, naked above, terminating in a capsule covered with a white hairy hood; simple, slender, reddish, four to seven inches high; leaves linear-lanceolate, entire; capsule oblong, four-sided; calyptra hirsute; operculum short-beaked, base convex; apophysis depressed; peristome, single with sixty-four teeth; connected at the summit by a horizontal membrane; inflorescence diœcious; sterile flowers terminal, cup-shaped. Solvents, alcohol, boiling water. Dose, from a half to two drams.

CONSTITUENTS—Not analyzed.

PREPARATIONS—Specific Polytrichum. Dose, from five to sixty minims.

Specific Symptomatology—The agent is used in anasarca, ascites, urinary obstruction, suppression of urine in children, febrile and inflammatory diseases, uric and phosphatic acid gravel, acute gonorrhœa with severe burning pain on passing urine, irritation of the bladder, difficult micturition of pregnancy, and often occurring during parturition.

Therapy—The agent is a hydragogue diuretic and causes a very large evacuation of urine when administered in dropsy, while it promotes the absorption of the fluid at the same time. It tends to relieve the pain of urinary calculi and to prevent their formation.

Though it is not always effective, probably on account of using a spurious article, the genuine has been known to remove forty pounds of urine from a dropsical patient in twenty-four hours.

APIS.**APIS MELLIFICA.**

Synonym—Honey bee.

Occurrence—A solution of the poisonous principle of the working bee, made from the bee, destroyed at a time of excitement and anger from irritation. Although the infusion or tincture are made from the entire bee, the active principle is supposed to be the poison of the sting.

Preparations—Tincture of Apis. Dose, from one-half to five drops. Specific Apis. A superior preparation, used by physicians of all schools; administered from ten to twenty drops in four ounces of water, a teaspoonful every two to four hours.

Specific Symptomatology—Acute swelling—œdema of the cellular tissues, local or general swelling, without the formation of vesicles; urinary irritation from atony; incontinence from feebleness; retention from irritation, with dark, heavy, scanty urine.

Therapy—The agent is prescribed in **dropsy** which appears suddenly. Old standing dropsies are not so readily influenced by it. **œdema glottidis** is subject to its influence, and it quickly relieves the œdema of the throat and nasal passages which accompany **diphtheria** and **scarlet fever**. It is also curative in the dropsy, which follows these two closely related diseases, from sudden suppression of urine. It influences the kidneys at the same time, causing an increase of the urine; it soothes the irritability of these organs and relieves the congestion present. When effusion from **pleuritis**, **peritonitis**, or other acute serous inflammation, is present, it is given with confidence.

In **retention** and **suppression** of **urine** in children, and the aged, from atonicity or general feebleness, it is a useful agent.

It is also useful in **irritable bladder** with teasing tenesmus, where the urine is scanty and high colored, when micturition is frequent and accompanied by much soreness and burning.

In the **urinary incontinence** of the aged and feeble it is prompt in its action.

In doses of two drops of the specific apis, four or five times daily, many cases of passive **hæmaturia** intractable to other remedies, will yield promptly.

ARALIA.

ARALIA HISPIDA.

Synonyms—Dwarf Elder.

Part Employed—The bark of the root.

Natural Order—Araliaceæ.

Locality—United States.

Botanical Description—*Aralia hispida* is a perennial herb growing in rocky places, from New England to Virginia; stem one to two feet high, the lower part woody and shrubby, thickly beset with sharp, stiff bristles, the upper part herbaceous and branching; leaves twice pinnate; leaflets oblong, ovate, cut-toothed; umbels many, simple, globose, axillary and terminal, on long peduncles, followed by bunches of dark-colored nauseous berries; fruit round, black, one-celled, containing three irregular shaped seeds. The whole plant exhales an unpleasant odor, and is

medicinal, but the bark of the root is most active. Solvents, alcohol, water. Dose, from ten to thirty grains.

CONSTITUENTS—Has not been analyzed.

PREPARATIONS—Specific Aralia. Dose, from five to twenty minims.

Specific Symptomatology—It is prescribed in **dropsies** of serous cavities, and **diffuse anasarca** from hepatic or renal inefficiency.

Therapy—A valuable, but infrequently used, remedy in **dropsy**. In **anasarca**, if given in active doses, it produces catharsis as well as diuresis, greatly augmenting the flow of urine and causing an excretion of water to a most serviceable extent. An infusion of aralia, given with other agents suggested for dropsy, will exercise a most immediate influence in the removal of the fluid. In **suppression of urine** it is an unirritating stimulant of much value. In **gravel** it is of some benefit, and may be given freely in combination with remedies directly indicated for other existing conditions.

SWAMP MILKWEED.

ASCLEPIAS INCARNATA.

Synonym—Flesh-colored Asclepias.

Part Employed—The root.

Natural Order—Asclepiadaceæ.

Locality—United States.

Botanical Description—Swamp milkweed is an herb growing in wet places and flowering in July and August; stem erect, smooth, with two downy lines above, two to three feet high, branched above, very leafy; leaves opposite, petiolate, oblong-lanceolate, hairy, acute, cordate at the base, four to seven inches long, one to two inches wide; flowers rose-purple, fragrant, disposed in terminal crowded umbels; nectary entire, horn exserted; umbels are from two to six, on a peduncle two inches long, consisting of ten to twenty small flowers; pods smooth; rhizome oblong, one inch in diameter, knotty, surrounded with rootlets, four to six inches long, externally yellowish-brown, internally whitish; bark thin, wood with fine medullary rays; rootlets have a thick bark and a thin ligneous cord in the center. The root emits a milky juice when wounded, and has a heavy odor, which is lost in drying; taste sweetish, acrid, bitter. Solvents, alcohol, water. Dose, from fifteen to forty grains.

CONSTITUENTS—Asclepiadin (the emetic principle), volatile oil, two acrid resins, an alkaloid, fixed oil, albumen, pectin, starch, glucose.

PREPARATION—Specific Swamp Milkweed. Dose, from one to twenty minims.

Physiological Action—Emetic, diuretic, anthelmintic, stom-

achic. Swamp milkweed affects the heart and arteries like digitalis, and is a speedy and certain diuretic.

Specific Symptomatology—*Asclepias Incarnata* strengthens the heart and is given in small doses, instead of digitalis, as a **diuretic** in **dropsy**. It often promptly relieves the general distress from extreme infiltration of the tissues, especially the dyspnoea.

Therapy—It may be given in coughs and colds, rheumatism from cold, painful stitches in the chest with threatened inflammation of the lungs and pleura, asthma, chronic gastric catarrh, diarrhoea, dysentery, dropsy, worms, erysipelatous diseases.

It is both emetic and cathartic, and may be used with advantage in the early stages of dysentery and diarrhoea.

It improves digestion, and is a good remedy in chronic catarrh of the stomach, and in catarrhal inflammation of the respiratory organs.

In rheumatic and catarrhal inflammations it should be given to produce slight nausea.

In doses of ten to twenty grains it acts as a vermifuge.

It is also beneficial as a local and internal remedy in erysipelas and erysipelatous diseases.

SAMBUCUS.

SAMBUCUS CANADENSIS.

Synonym—Elder.

Parts Employed—The flowers and fruit.

Natural Order—Caprifoliaceæ.

Locality—United States.

Botanical Description—An indigenous shrub growing on low damp soil, in thickets, flowering in July, maturing its fruit in September and October. The shrub is about eight feet in height, bark scabrous; leaves bipinnate, antiposed, leaflets in three or four pairs, acuminate, smooth, serrate; flowers numerous, white, in large level-topped, five-parted cymes with a heavy odor.

PREPARATIONS—Specific Sambucus. Dose, from two to ten drops.

Therapy—The strong infusion is diaphoretic and stimulating. The agent has also alterative, cathartic and diuretic properties which are of value in urinary inactivity, with excretion of renal sand, accompanied with muscular aching stiffness, or rheumatic pains.

A strong infusion is sometimes of great service in removing **dropsical effusions**. Cases are reported in which extreme general dropsy seemed to threaten immediate death, where relief was quickly and permanently obtained by the use of this remedy.

SARSAPARILLA.**SMILAX OFFICINALIS.**

Synonyms—Jamaica, Honduras or Spanish Sarsaparilla.

Part Employed—The roots.

Natural Order—Liliaceæ.

Locality—American Tropics.

Botanical Description—A large perennial climber with twining, angular, prickly, stiff, woody, shrubby stems; rhizomes short, thick, knotted; nodes thick, with purplish-white roots, six or seven feet long; leaves oblong-ovate, acute, cordate, smooth, twelve inches long, four inches wide; petioles an inch long, bearing tendrils above the base.

CONSTITUENTS—Parillin, sarsa-saponin, saponin, volatile oil.

PREPARATIONS—Extractum Sarsaparillæ Fluidum, Fluid Extract of Sarsaparilla. Dose, from one-half to one dram.

Extractum Sarsaparillæ Fluidum Compositum, Compound Fluid Extract of Sarsaparilla. Dose, from one-half to one dram.

Therapy—This agent is an active eliminant, possessing diuretic and alterative properties to a marked degree. It has long been a popular remedy for the treatment of blood dyscrasias, but is nearly always given in combination with other well known specific alteratives. In combination with potassium iodide, stillingia, corydalis, phytolacca, podophyllum, or other alteratives, it has been given in **scrofula** and **secondary syphilis**, and especially in **cutaneous diseases** depending upon blood dyscrasia, and in **rheumatic** and **gouty** conditions, with inactive kidneys irritated from the presence of large quantities of uric acid and the urates. It is not at present in general use.

HYGROPHILIA.**HYGROPHILIA SPINOSA.**

The above named agent is a native of Ceylon where it is used as a remedy for all **dropsical** conditions. It is but little known in America, but may be received on the reliable authority of the native physicians of Ceylon, who use an infusion of the plant, two ounces to the pint, the entire quantity to be given within twenty-four hours. The remedy produces **active diuresis**, but the reports are as yet so meager that we have no way of knowing in what way the agent acts upon the organs to produce its desired effects.

It is a powerful diuretic and is a stimulant and tonic to the sexual apparatus.

CHAPTER V.

RHUS AROMATIC.

JAMBUL.

POTASSIUM NITRATE.

POTASSIUM ACETATE.

POTASSIUM CHLORATE.

SODIUM SALICYLATE.

FRAGRANT SUMACH.

RHUS AROMATICA.

Synonym—Sweet Sumach.**Part Employed**—The bark of the root.**Natural Order**—Anacardiaceæ.**Locality**—United States.

Botanical Description—A straggling bush of from three to seven feet in height, common in the northern and eastern portion of the United States, from Minnesota and Vermont southward to Florida and Mississippi. It is characterized by the possession of a milky sap. The leaves are alternate, the flowers small, often polygamous and regular; the ovary one-celled and one-ovuled, with three styles or stigmas. The genus itself is marked by a small, five-parted calyx, five petals, five stamens inserted under the edge or between the lobes of a flattened disk in the bottom of the calyx; fruit small, about the size of a pea and indehiscent, a sort of dry drupe, globular and covered with crimson hairs.

CONSTITUENTS—Volatile oil, several resins, fat, tannin, gum.

PREPARATIONS—Extractum Rhois Aromaticæ, fluidum, fluid extract of Rhus Aromatica. Dose, from ten to thirty minims. Specific Fragrant Sumach. Dose, from five to thirty minims.

Therapy—The direct influence of this agent is exerted in certain cases of polyuria. It is said to be specific also to **nocturnal enuresis** in children, and yet our knowledge is not sufficient to define the exact cases, consequently its use is more or less empirical. Benefit is claimed from its use in full doses in all cases where there is *much urine*, without sugar.

This is the case in **interstitial nephritis** as well as in **simple diabetes insipidus**. It is not contraindicated in diabetes mellitus, but is only occasionally of service. Active astringent properties are claimed for it, and yet in this exercise it is different from ordinary astringents.

In many cases of **urinary incontinence** both in children and in the aged, it will produce satisfactory cures. It apparently acts as a tonic and sedative to the muscular structures of the urinary apparatus, as old people who suffer from a general debilitated condition and are troubled with **dribbling**, have the power to control the urine restored. It should be used freely in such cases, and its influence when specifically defined will give it an important place in the therapeutics of **enuresis**.

It has an influence not to be overlooked in **passive hemorrhages** from the urinary apparatus—**hæmaturia**, controlling most satis-

factorily many cases. It is useful in passive **uterine hemorrhage** and in **pulmonary** and **bronchial** hemorrhage. It is also useful in controlling **night sweats** and the diarrhœa of phthisis. The hemorrhage often present in **chronic diarrhœa** and **dysentery** is restrained by it, when it checks the action of the bowels also, improving the tone and restoring normal function.

If satisfactory results are not obtained from small doses it may be pushed until sixty drops are given to an adult.

In **purpura hemorrhagica** it has worked nicely and will often be found useful. It has cured many cases of **leucorrhœa** and of **gonorrhœa** and other passive discharges of a catarrhal character.

JAMBUL.

SYZYGium JAMBOLANUM.

Synonyms—*Eugenia Jambolana*, Java Plum, Jamboo.

Part Employed—The seeds.

Natural Order—Myrtaceæ.

Location—East Indies and Queensland.

Botanical Description—This tree is usually of large size, with a thick and rather crooked trunk, yields an abundant crop of sub-acid, edible fruit during the months of July and August. It is common all over the East Indian peninsula, both in its wild and cultivated states, every soil and situation suiting it equally well. The bark dyes an excellent brown color. The timber is whitish in color, hard, close-grained and durable. The bark is whitish with some few cracks, and is used extensively as a brown dye. Branches irregular, the smaller depending, the whole forming a very large, beautiful, shady head.

The seeds are grayish-black, about three-eighths of an inch long and one-third of an inch in diameter, hard, dense, and nearly tasteless.

PREPARATIONS—Jambul in powdered form. Dose, three to ten grains, two or three times a day.

Fluid extract jambul seed, miscible with water. Dose, five to ten minims.

Physiological Action—The exact influence of this agent upon the system is not well known. It is a stomachic astringent and carminative, a remedy of value in diarrhœas. It is non-toxic and non-irritant.

In the diarrhœas of children the juice of the fresh bark and leaves is used by the native physicians, though all parts of the plant are astringent. In the preparation of astringent injections and gargles the bark is quite active. The root and seeds have the same influence.

The taste is at first bitter, afterwards distinctly pungent, and decidedly astringent. Experiments have been conducted to de-

termine the influence of jambul upon diastatic fermentation. It is proven to have a positive inhibitory influence. A fixed amount of malt extract converted 22.4 grains of starch into sugar. Jambul was added, and only 6.3 grains were converted under exactly similar circumstances. This experiment was suggested by the characteristic influence of the agent when taken by diabetic patients.

According to Morse, the agent augments the vaso-motor and reflex functions of the spinal cord by augmenting the blood pressure of the renal arterioles. It diminishes the quantity and density of saccharine urine. It increases peristaltic action of the intestines, and causes deeper and more frequent inspiratory movements. Wounds and ulcers, or syphilitic sores in diabetics, cicatrize rapidly, and heal during the administration of this agent.

Therapy—Its specific therapeutic application lies in the fact that the bark and the seeds possess the property of arresting excessive formation and excretion of sugar in **diabetes**, the seeds being the most active.

Inasmuch as the pathology of the disease is obscure, and the physiological action of the agent is comparatively unknown, it is impossible to make other than an empirical use of this remedy in these cases. Given in from five to ten grains of the powdered seeds, three times daily, it soon overcomes the thirst and weariness and diminishes the quantity of urine. After two or three weeks the strength and spirits will return, and wandering and distressing pains and cramps abate, bleeding from the nose or gums, and night sweats, will cease, and the quantity of sugar will gradually decline. The dose may be increased until forty grains are given in a day, and the probabilities are that large doses would produce no serious results.

The agent is widely used in the treatment of this disease, and is as efficient as any other single remedy. The writer's experience proves that it acts best in those cases that have been long continued, with a comparatively small amount of sugar present, where the slow progress of the disease has not materially influenced the general health of the patient.

Among the qualified, observing physicians of India, it is believed that its use will prevent the conversion of starches into sugar to any excessive extent, and that starchy diet can be eaten with impunity during its administration.

POTASSIUM NITRATE.**Formula**— KNO_3 .**Synonyms**—Nitrate of Potassium, Saltpetre.

Occurrence—This substance is found in many localities, as a saline efflorescence upon the soil and in the fissures of limestone rock. It occurs abundantly in Europe, Egypt, India and China, and very extensively in the United States. Vegetation contains a very large quantity of this salt. It is obtained first in the form of crude saltpetre, which is purified by solution in water and crystallization.

Description—It occurs in the form of rhombic prisms, colorless and transparent, with a pungent and saline taste, slightly acid; at other times as a crystalline powder. It is freely, but rather slowly soluble in water, but slightly soluble in alcohol.

Administration—Five grains in solution every three hours is the usual dose. Ten grains three times daily is advised in chronic rheumatic conditions.

Physiological Action—The range of action of this remedy is quite extensive, and among the older physicians it was considered an important agent. The influence of Potassium Nitrate upon the nervous system tends to produce depression, a disposition to sleep, general relaxation, and reduction of nervous excitability. In overdoses it causes great reduction of the pulse, slowing the heart's action, reducing arterial tension, and lessening the body heat to a marked degree. It materially alters the character of the blood, reducing the number of red blood corpuscles and increasing its fluidity. It causes headache, vertigo and paralysis with dullness of the special senses. Convulsions sometimes supervene and death follows. If the toxic dose has been large, evidences of purging or inflammation of the stomach and bowels occur with bloody discharges.

If there is a free determination of blood to the skin, the body surface being warm and moist, it acts immediately as a diaphoretic, otherwise it acts upon the kidneys as a diuretic. Its influence varies also with the size of the dose, and with the quantity and temperature of the water in which it is dissolved.

Therapy—Physicians of fifty years ago depended upon this remedy as a **sedative** to control fevers, but large doses are necessary to accomplish this result. It tends to keep the bowels relaxed, does not greatly irritate the stomach, and acts as an intestinal antiseptic.

The drug is an active eliminating agent. It neutralizes excess of acidity in the blood and urine, and rapidly relieves the blood of morbid material. It has long been used in **rheumatism**, both of an acute and chronic character, in **myalgia**, **lumbago**, **tic douloureux**, **sciatica**, and other forms of neuralgia. Two or three grains every two hours will accomplish satisfactory results in acute cases.

Although antispasmodic properties are attributed to it, its influence in the above described conditions is probably due to its neutralizing and eliminative action.

It is sometimes given in **tonsillitis**, which it will abort in large doses.

If this salt be burned and the vapor inhaled, it will relieve the paroxysms of uncomplicated spasmodic asthma. Bibulous paper—blotting paper—should be saturated with a solution of the salt in the proportion of one dram to an ounce of hot water, and then be carefully dried, when it is ready for use. Of this from twelve to twenty square inches should be burned and the fumes inhaled. It should burn with white fumes without smoke or explosive action, and not too fast. When burned in a pitcher or in a narrow mouthed jar the fumes are more conveniently inhaled.

POTASSIUM ACETATE.

Formula— $\text{KC}_2\text{H}_3\text{O}_2$.

Synonym—Acetate of Potassium.

Occurrence—This common agent is formed by an interchange in the molecular construction of carbonate of potassium and acetic acid. A better salt is produced if the bicarbonate of potassium, instead of the carbonate, is used. It is found in nature in some plant juices and in the sap of trees, crude acetic acid being obtained from the destructive distillation of wood.

Description—A crystalline white powder, nearly neutral, with a warm, rather salty, pungent taste, very deliquescent, readily soluble in both water and alcohol. Dose, from one to twenty grains.

Physiological Action—It is directly a renal depurant, greatly increasing the amount of solids in the urine, by stimulating both the excretion and the secretion. It has but little influence upon the excretion of the watery portion of the urine. In large doses it produces aching and even pain in the kidneys. It promotes retrograde metabolism throughout the system and increases waste, thus acting as a direct alterative. This is plainly apparent when the sudoriparous glands are inactive and the skin becomes rough and coarse, or **pimples**, **pustules** and other skin disease is present. It stimulates excretion rapidly by the kidneys and relieves the irritation of the skin promptly, and greatly facilitates the cure of these conditions.

Therapy—This agent may be used instead of the iodide of potassium, as an alterative in eczema and other skin diseases of childhood, and will be found a valuable remedy.

In glandular diseases of childhood, where the iodide salt is usually prescribed, this simple remedy, combined with vegetable alteratives, will often produce all of the good effects, with none of the unpleasant results, of the iodide. In **glandu-**

lar inflammations, acute and chronic, it is a valuable agent. If given in full doses of from ten to fifteen grains with aconite, every two hours, in the first stages of mastitis, ovaritis or orchitis, it will often abate the disease within eighteen hours. It is most reliable.

If the kidneys are normal it will hasten the removal of morbid products in all acute inflammations, but its administration must be conducted with discretion, and the kidneys must not be over-taxed. It is best given with an abundance of water, that the solid waste stimulated in the kidneys, may be fully diluted.

It neutralizes excessive acidity probably to a limited extent by decomposition and liberation of the alkaline potassium carbonate.

It has been much used in **rheumatism**, but is now largely replaced by the salicylates, which accomplish the same and often increased results. It is, however, the best remedy of the two where the stomach refuses to tolerate the salicylic acid salts as it often does.

Cloths wet in a hot solution of acetate of potassium are most valuable as an application to **acute rheumatic inflammation** of the **joints**.

In **lithæmia** its influence is most direct. The dosage prescribed in these cases is usually too large. It works more satisfactorily if given in doses of one or two grains, five or six times daily, quickly relieving the aching in the back, so common to this condition, and promoting a clear and normal urine, reducing, instead of increasing, the specific gravity.

It acts upon the liver promptly, stimulating a flow of bile, and overcoming **hepatic congestion**. It has long been used in jaundice, and exercises a desirable influence upon the glands of the entire intestinal tract.

It is a remedy for **boils** and other persistent **skin eruptions**, and will be found valuable in **carbuncle** as an active eliminative.

POTASSIUM CHLORATE.

Formula— KClO_3 .

Synonym—Chlorate of potassium.

Occurrence—This salt is obtained by mixing equal parts of potassium carbonate and calcium hydrate in solution and subjecting the whole to the action of chlorine gas. The resulting liquid is first boiled, then cooled. The salt crystallizes and precipitates.

Description—It is a crystalline body forming in plates or prisms, lustrous, colorless and odorless. It has a cooling, saline taste and is permanent in the air. It dissolves in sixteen and

seven-tenths parts of cold water and in one and seven-tenths parts of boiling water, and is insoluble in alcohol. It sometimes occurs in the form of a white powder with the above properties.

The agent is unstable, readily giving up its oxygen. Heated, triturated with force together with organic bodies, or any easily combustible body, it explodes violently. Great caution should be observed in its use because of these facts. Dose, from one to five grains in solution.

Physiological Action—The physiological action of this agent is that of an irritant poison. It depresses the action of the heart, lowers arterial tension, disorganizes the red blood corpuscles, converting the hæmoglobin into methæmoglobin. The product of the disorganization is excreted by the urine. It produces enlargement of the liver, kidneys and spleen, inducing inflammation of the entire gastro-intestinal tract. When death occurs from its use there is delirium and coma or convulsions. Continued use of the agent even in medicinal doses may produce irritation and congestion of the kidneys with albuminous urine and difficult renal action. It is apt to produce cutaneous eruptions, papular, vesicular, or erythematous in character.

Therapy—The agent is an active antiseptic, although not usually so classed. In the early treatment of **diphtheria** it first came into prominent use as a remedy for that disease, for which it is usually used in conjunction with the chloride of iron. Given after exposure, before the development of the symptoms, it is said to ward off an attack of the disease. Its solution is useful in all cases of **ulceration** of the **mouth** or of the **stomach**. It is given in frequent doses, and is used freely as a mouth wash, especially valuable if the gums are spongy and tend to bleed readily, and there is fetid breath. It is specific in **mercurial stomatitis** and was long advised in conjunction with mercurial treatment, to prevent the salivating influence of mercury. It prevents the formation of false membrane and hastens its detachment in **membranous croup**. It is useful in the sore throat of **scarlatina**, but it must be given with caution in this disease, because of its irritating influence upon the kidneys.

Its solution is useful in specific or non-specific **urethritis**, **vaginitis** and **cystitis**, in which mild solutions are more efficacious than saturated ones. It is useful also in **hemorrhoids** and in **rectal ulcers** and fissures.

It has been used in **phthisis**, **pulmonalis**, in **syphilis**, **scrofula** and in **scurvy**, but its use in these conditions is now obsolete as we have many greatly superior remedies. Local ulcerations of the mouth or throat, or ulcerations of any mucous surface occurring in the course of these constitutional diseases may be well treated with this salt in solution, but its continued internal use is not advised.

This agent is useful in the treatment of **leucorrhœa**, and in **ulcerations** of the **os uteri** or of the walls of the **vagina**, in solution in a douche.

SODIUM SALICYLATE.

Formula— $\text{NaC}_7\text{H}_5\text{O}_3$.

Synonym—Salicylate of sodium.

Occurrence—This salt is prepared by the action of salicylic acid upon pure sodium carbonate.

Description—A white, or yellowish, or pinkish-white amorphous powder, without odor, having a sweetish, saline, disagreeable, slightly nauseating taste; permanent in dry air; soluble in water, alcohol and glycerine; decomposed by heat. Dose, from three to twenty grains, dissolved in water, or in an aromatic elixir.

Physiological Action—The agent acts upon the economy similarly to salicylic acid. Its ready solubility renders it much more valuable. It is irritating to the stomach to a limited extent. Although the salicylate of sodium may be given with impunity in the conditions in which it is indicated, there are certain undesirable, and in certain cases serious results, that follow its use, which must be anticipated. The best known of these is the suppression of the gastric fluids and interference with the digestion.

A writer in the *Journal of Cutaneous Diseases* mentions severe cases of erythema and urticaria from its use. In another case twenty grains were ordered to a man three times daily. After taking only three doses (one dram) of the drug an urticarial eruption, quickly becoming petechial, appeared on the body and extremities. The hemorrhagic extravasation was so great at certain points, as to cause subsequent sloughs and ulcers. Almost every part of the surface of the body except the palms of the hands and soles of the feet, were attacked during the course of the disease, accompanied by myalgic and arthritic pains. The tongue, larynx and pharynx were affected by the eruption and were so swollen as to threaten suffocation. No blood or pus was found in the urine and there was no disturbance of the bowels.

Therapy—In the larger part of the conditions named as benefited by the use of salicylic acid this agent may be prescribed, often with better results than occur from the use of the acid.

It is perhaps the best of our remedies for **rheumatism** wherever located and whatever the cause or duration. Both this agent and the acid may be given internally and applied freely externally. They may be applied in solution, or the powders may be sprinkled upon cotton and applied dry and kept warm. There is authority for the statement that occasional

large, full doses of this sodium salt in rheumatism will act more rapidly, and produce less gastric irritation, than if given in frequently repeated small doses.

Sodium Salicylate has a specific influence in the treatment of **acute coryza**, when there is fullness of the head across the eyes, with watery secretion, sneezing, chilliness, malaise, and general depression. Two or three fifteen grain doses of this salt, taken two hours apart have often dissipated every symptom, for the writer. **Supra-orbital pain** from the above cause, or of a neuralgic or rheumatic character, is most quickly dissipated by it. Sodium Salicylate is of benefit in **whooping-cough**. Two or three grains may be given twice or three times each day and excellent results obtain.

This remedy relieved a most severe case of **universal cutaneous pruritus** of nervous origin. Fifteen grains, threetimes daily, controlled the entire phenomena in three days..

In the treatment of **inflammatory diseases** of the mucous structures of the **kidneys** and **bladder**, this agent is of much service, its influence being largely due to its antiseptic and soothing properties. Upon the secretory function of the kidneys in lithæmia and rheumatism the **salicylate of lithium**, however, is the preferable salt.

CHAPTER VI.

STAPHYSAGRIA.
SALIX NIGRA.

SAW PALMETTO.
DAMIANA.
CUBEBS.

COPAIBA.
SANDALWOOD.

STAPHYSAGRIA.

DELPHINUM STAPHYSAGRIA.

Synonym—Stavesacre.

Part Employed—The seed.

Natural Order—Ranunculacæ.

Locality—Europe.

Botanical Description—*Delphinium staphysagria* is a handsome annual or biennial plant, about forty inches high; stem simple, erect, hispid; leaves alternate, long-petioled, four to five inches broad, palmately five to nine parted, foot-stalks hairy, lanceolate, pubescent, segments entire or three-lobed; flowers pale-blue, long peduncled, in terminal racemes, with hairy pedicels one inch long, bracts inserted at the base; petals five, two lower spatulate, the uppermost projected backwards to form a spur, which incloses two spurs of the upper leaflets of the nectary; capsules three, large, villous, containing many globose, three-cornered, thick, black seeds. The odor of the plant is unpleasant.

The seeds are one-fifth inch long, one-sixth inch broad, flat-

tish-tetrahedral, one side convex, brown or brownish-gray, with reticulate ridges, containing a whitish, oily albumen and a straight embryo; nearly inodorous; taste bitter, acrid (U. S.). Solvents, alcohol, water. Dose, from one to two grains.

CONSTITUENTS—Delphinum, delphinoidine, delphesine, staphysagrine, fixed oil, volatile oil, malic acid, mucilage.

PREPARATIONS—Tinctura staphysagriæ, tincture of staphysagria. Dose, from five to fifteen minims. Specific staphysagria. Dose, from one-sixth to three minims.

Physiological Action—This has not been definitely determined. Taken internally it acts as an irritant, causing vomiting and purging. Absorbed into the circulation it causes convulsions and loss of sensation and motion; the action of the heart and respiration is lessened and death is caused by paralysis of the spinal cord and asphyxia. It first contracts and then dilates the pupil.

Specific Symptomatology—This agent exercises a stimulant and tonic influence upon the central nervous system, and is especially valuable in sexual disorders accompanied with melancholia, hypochondria, and hysteria, especially if there be outbursts of passion and a tendency to moroseness.

Therapy—It relieves irritation of the **prostate gland, testicles,** and **vesiculæ seminales,** overcomes **impotency,** and increases sexual power. It arrests the excessive prostatic discharge and moco-purulent discharges from the urethra and is exceedingly valuable in old standing cases of **gleet,** often curing otherwise intractable cases, and in **dysuria,** especially if accompanied with feebleness in expelling urine, with the above specific indications.

It soothes the nervous excitement consequent upon these genito-urinary or uterine disorders and is prompt and permanent when prescribed directly.

Five drops of specific staphysagria in two ounces of water, a teaspoonful every two hours it is said, correct many cases of **night sweats** in phthisis. If the symptoms should increase after its use, the dose should be decreased.

King recommends staphysagria to be used externally for the destruction of lice. Equal parts of the fluid extract and cologne water have been used successfully in cases of pediculus pubis, and pediculus capitis.

SALIX NIGRA.

SALIX NIGRA AMENTS.

Synonym—Black Willow.

Part Employed—The aments.

Natural Order—Salicacæ.

Locality—United States.

Botanical Description—The black willow is a tree about twenty-five feet high, with a blackish, rough bark, found growing along rivers and in moist places, especially in New York

and Pennsylvania; leaves lanceolate, acute, narrow, serrulate, smooth, green, petioles and mid-ribs tomentose; flowers diœcious in catkins, erect, hairy, cylindrical; stipules small; scales oblong, villose; sterile aments three inches long, glands two; stamens four to six; filaments bearded at the base; ovary smooth, ovoid; style short; stigma bifid; branches pale-yellow; taste bitter, astringent. Solvents, alcohol, water. Dose, from one-half to one dram.

CONSTITUENTS—Salicin, a glucoside, tannin, wax, gum.

PREPARATIONS—Specific *Salix Nigra* Aments. Dose, from ten to sixty minims.

The tincture of the aments, or catkins, of the black willow have increased medicinal properties over any other part of the tree. Specific *Salix Nigra* Aments is a unique preparation and contains the full properties of the drug.

The agent was brought to the attention of the profession through its influence in controlling **sexual hyperæsthesia** and undue sexual excitement. It is a remedy for **satyriasis**, **erotomania**, and **nymphomania**, more particularly from local irritation.

It relieves **spermatorrhœa** when dependent upon these or similar causes, and quiets the general nervous system. It is a remedy for **ovarian congestion**, ovarian neuralgia and hyperæsthesia, also for **ovarian irritation** in hysteria. It will exercise a direct and satisfactory influence in many cases of **hysteria**, overcoming the extreme excitability and nervousness, headache and the *globus hystericus*, and will permit quiet, restful sleep. It will serve an excellent purpose in these cases in combination with general nerve tonics and restoratives, greatly enhancing their influence.

SAW PALMETTO.

SERENOA SERRULATA.

Synonyms—*Sabal serrulata*.

Part Employed—The fruit.

Natural Order—*Palmæ*.

Location—Florida to South Carolina.

Botanical Description—The saw palmetto is indigenous to the southern portion of the United States, growing especially along the southeastern coast. It is a variety of the palm—the palmetto scrub. It has a creeping, branching stem, leaves circular in outline, fan-shaped, bright green, short, slender plano-convex, more or less spiny-edged petiole, the numerous erect divisions slightly cleft at the apex, and without thread-like filaments in the sinuses; spadix densely tomentose, much shorter than the leaves; petals scarcely united; style slender, drupe ovoid-oblong.

PREPARATIONS—Extractum saw palmetto fluidum, fluid ex-

tract of saw palmetto. Not miscible with water. Dose, one-half to one dram.

Specific Saw Palmetto. Dose, ten drops to one dram.

Physiological Action—The attention of the profession was called to this palm by Goss and others, from its superior fat producing properties in animals. It was observed as soon as the berries matured that the animals which fed upon them grew very sleek and fat. Read noticed the marked healthfulness of these animals, and concluded to try the berries as a medicine. As a result he found them to improve the digestion, increase the flesh, strength and weight, and steadily relieve irritation of mucous structures, especially those of the nose and air passages. Subsequent observation has proven the remedy to be a tonic of much power in stimulating the nutrition of the nerve centers, upon and through which it operates.

It relieves irritability of the entire nervous system and soothes local irritation. It stimulates digestion, greatly improves the appetite, and encourages assimilation.

As stated, it influences the mucous structures of the nose, throat and bronchi in a remarkable manner, overcoming catarrh and restoring normal function.

Specific Symptomatology—The direct influence of this agent is exerted upon the entire **reproductive apparatus**, especially upon the prostate gland of the male. It is demanded in **enlarged prostate**, with throbbing, aching, dull pain, discharge of prostatic fluid, at times discharge of mucus, also of a yellowish, watery fluid, with weakened sexual power, **orchialgia**, **epididymitis** and **orchitis**, when associated with enlarged prostate. In women, **ovarian enlargement**, with tenderness and dull, aching pains, weakened sexual activity, and small, **undeveloped mammary glands**, are much benefited by its continued use.

Therapy—It is a sedative to all irritable conditions of these organs, and is a profound nutritive tonic, operating much like phosphorus. It increases the size and secreting power of the mammary glands where they are abnormally small and inactive. It improves the tone, and overcomes irritability of the ovaries, relieving dysmenorrhœa when due to atonicity. It may be given with confidence in wasting of the testes in the early stages, and the author has retarded the development of varicocele and has developed the growth and nutrition of the testes materially by its use.

To this agent is ascribed almost miraculous powers in reducing the size of **hypertrophied prostate** in old men, and in quickly, relieving cystic and other disorders incident to this condition. In the writer's hands it has produced no marvelous cures of this disorder, but has been of assistance to other measures and could not be well dispensed with. It relieves irritation of the

bladder to a satisfactory extent, correcting the irritable character of the urine, increases the muscular power of the patient to expel the urine and produces a sense of relief, that is in every way gratifying and satisfactory.

In the treatment of **impotence** in young men who have been excessive in their habits, or have masturbated, it can be relied upon with positiveness. It will overcome the excitability from exhaustion and increase sexual power in those newly married who, having been anxious concerning their sexual strength or ability, have become suddenly almost entirely impotent after marriage. If the patient is instructed to abstain, for from four to six weeks, and to have confidence in his ultimate recovery, this agent in doses of from twenty to thirty drops three or four times daily, combined with a direct nerve tonic, such as *avena sativa* in doses of fifteen drops, or the one one-hundredth of a grain of phosphorus, will establish a cure. It will relieve any undue irritation, due to excesses and exhaustion, that may be present in any part of the genito-urinary apparatus.

This agent is a remedy for **sexual neurasthenia** or sexual perversion with nerve exhaustion, a condition often overlooked in diagnosis, but quite common, one which follows onanism more often than any other habit. Its use should be persisted in for weeks, in the treatment of this form of nerve exhaustion, and if combined with *avena sativa*, the phosphates, strychnia, or the tonic gold salts, and abstinence enforced, a cure will result more readily than with all the rest without it.

In its influence upon the **nasal** and **bronchial mucous membranes** this agent has been given with excellent advantage in the treatment of **acute catarrh**, **chronic bronchial coughs** of all characters, including **whooping cough**, **laryngitis** and the **cough of phthisis**. It is credited also with cures in the treatment of **aphonia**.

DAMIANA.

TURNERA APHRODISIACA.

Synonym—*Turnera Microphylla*.

Part Employed—The leaves.

Natural Order—Turneraceæ.

Location—Southwestern United States and Mexico.

Botanical Description—A small, mint-like plant, with yellowish-white fragrant flowers, sub-sessile near the end of the branches; calyx tubular; hairy externally; five-toothed at the apex; five petals inserted on calyx tube; fruit one-celled, globular, small, warty and rough externally, containing kidney-shaped seeds.

PREPARATIONS—*Extractum damiana fluidum*, fluid extract of damiana. Dose, from one-half to one dram.

Specific damiana. Dose, from two to ten minims.

CONSTITUENTS—Essential oil, chlorophyll, two resins, albuminoids, tannin.

Therapy—A mild nerve tonic claimed to be valuable in the treatment of **sexual impotence**. Some of our physicians praise it highly for its influence in **sexual neurasthenia**, and it is said to correct **frigidity** in the female.

It had long enjoyed a local reputation as a stimulant **tonic** of the **sexual apparatus** among the natives of Mexico, before it attracted the attention of the profession. Besides its peculiar action on the sexual appetite and function, it is a general tonic, somewhat cathartic, and is slightly cholagogue.

The midwives and women of loose morals of western Mexico also attribute **emmenagogue** properties to it.

Dr. Reid uses damiana in all conditions where a general tonic is needed, especially if there be enfeeblement of the central nervous system. He esteems it most highly, prescribing it constantly for this purpose.

It is valuable in **renal** and **cystic catarrh** and in general irritation of the urinary passages, through its influence in soothing irritation of mucous membranes.

This latter property renders it valuable in the treatment of **respiratory disorders**, especially those accompanied with profuse secretion.

CUBEBA.

PIPER CUBEBA.

Synonym—Cubebæ.

Part Employed—The unripe fruit.

Natural Order—Piperaceæ.

Locality—Java and other parts of the East Indies.

Botanical Description—Piper Cubeba is a climbing perennial dioecious shrub; rooting at the joints; stem smooth, thickness of a goose quill, ash-colored, flexuous, jointed; leaves entire, petiolate, ovate, or ovate-lanceolate, coriaceous, rounded or obliquely cordate at the base, strongly nerved, smooth, shining, four to six inches long, one to two inches wide; flowers arranged in spikes, about one and a half inches long, at the end of the branches opposite the leaves, on peduncles the length of the petioles; fruit about the size and appearance of black pepper, about one-fifth inch in diameter, contracted at the base into a small stalk, and pointed at the apex; of a blackish-gray color, reticulately wrinkled surface, mesocarp with many oil cells, internally hollow; odor aromatic; taste hot, bitter, aromatic. Solvents, alcohol, ether. Dose, from half a dram to one dram.

CONSTITUENTS—Volatile oil, fixed oil, wax, resin, cubebin, gum, malates, cubebic acid.

PREPARATIONS—Extractum Cubebæ Fluidum, Fluid Extract of Cubeb. Dose, from five to thirty minims. Oleum Cubebæ,

Oil of Cubeb. Dose, ten minims. Oleoresina Cubebæ, Oleo-resin of Cubeb. Dose, from five to thirty minims. Specific Cubeb. Dose, from five to twenty minims.

Physiological Action—Stimulant, carminative, expectorant, stomachic. It stimulates the intestinal tract like black pepper, and, in excessive doses, causes nausea, vomiting, burning pain, griping and purging. The active principle being absorbed causes general stimulation and a feverish condition, and sometimes redness of the skin.

Therapy—Cubeb is in common use in the treatment of **gonorrhœa**. Its best results are obtained when the active stage has passed, being especially useful in gleet, and also useful in the discharge present after acute prostatitis, especially if purulent in character, where the parts are greatly debilitated and there is **catarrh** of the **bladder** with nocturnal incontinence of urine, or in **spermatorrhœa** with enfeeblement, it is a useful remedy.

A snuff of powdered cubeb is of much benefit in **acute coryza** if there is free secretion. It is beneficial also in some chronic cases.

A cigarette is prepared of cubeb, which is smoked to relieve **hoarseness**. It serves a good purpose in this form in sub-acute or chronic bronchitis or in any case of general relaxation with debility of the mucous structures of these parts.

COPAIVA.

COPAIBA LANGSDORFFII.

Part Employed—The oleoresin.

Natural Order—Leguminosæ.

Locality—Brazil.

Botanical Description—There are several species of copaifera which yield the oleoresin of Copaiba, mostly indigenous to tropical America.

The copaiba langsdorffii is a rather large tree, much branched, bark brown, smooth; leaves pinnate; leaflets three to five pairs, one or two inches long, coriaceous, entire, ovate, smooth, pellucidly punctate; flowers small, white, racemose, apetalous; fruit-pod one inch long, dehiscent into two valves, one-seeded.

Oleoresin of Copaiba is obtained by boring holes into the trunk near its base, from which the oleoresin flows freely and is collected. It is a translucent, viscid liquid, of a pale or brownish-yellow color, having a characteristic odor and a bitter, acrid, nauseous taste. Solvents, alcohol, ether, chloroform. Dose, from five to sixty grains.

Oleum Copaiba—Oil of Copaiba. The volatile oil, which is obtained by distillation, is a limpid, pale-yellow liquid, with

the odor of Copaiba, and a pungent, aromatic, bitter taste. Dose, from ten to fifteen drops.

CONSTITUENTS—Volatile oil, copaic acid, bitter principle, resin.

PREPARATIONS—*Massa Copaibæ*, Mass of Copaiba. Dose, from ten to sixty grains.

Mistura Copaibæ Composita, Compound Copaiba Mixture. Dose, from a half to one dram.

Therapy—This agent is used in the treatment of **gonorrhœa**. It is best used after active inflammation has subsided where the mucous structures of the urinary tract are debilitated. It is useful in **gleet** or **chronic urethritis** with much relaxation and debility, and if anæmia be present, it should be given in conjunction with iron. It is given in general irritation of the urinary passages from debility, and in **pyelitis** and **cystitis**, increasing the urinary discharge and relieving painful urination. In inflammation of the **respiratory tract** with excessive expectoration of thick and tenacious mucus, it may be employed to good advantage.

The agent has been used widely in the treatment of many other conditions for all of which we have direct remedies devoid of the objectionable features of Copaiba.

SANDALWOOD.

SANTALUM ALBUM.

Synonyms—Yellow Saunders, White Saunders.

Part Employed—The wood.

Natural Order—Santalaceæ.

Location—India.

Botanical Description—A small evergreen tree; trunk twenty to thirty feet high; branched low down; two and a half to three feet in circumference; bark brownish; branches numerous, much divided, spreading and rising in every direction, forming nearly a spherical head; the young shoots round and smooth; leaves opposite, petioled, oblong, smooth, entire, glaucous below, from one and a half to three inches long; flowers one-sixth of an inch in diameter, numerous, small, at first straw-colored, changing to a deep purple, as are all the external parts of the growing plant, even when bruised.

PREPARATIONS—Fluid Extract of Sandalwood, not miscible with water. Dose, one-half to two fluid drams. Sandal Oil, dose, ten minims.

Administration—The oil of sandalwood is administered in doses of from ten to fifteen or even twenty minims three times daily. It is best given in a capsule, and soft gelatine capsules are prepared filled with the oil. It is also given in emulsion but there are objections to this method of administration.

Therapy—The oil of santal is of service in the treatment of sub-acute and chronic inflammations of mucous surfaces, especially those wherein there is excessive secretion. In **catarrhal bronchitis** it is beneficial, quickly allaying irritation and reducing the excessive discharge.

It is in more general use in the treatment of **gonorrhœa** after the subsidence of the acute or active inflammatory phenomena. It will be found of service in the treatment of protracted cases, and in **gleet**.

CHAPTER VII.

Agents Used for Their Influence Upon the Skin.

JABORANDI.

SERPENTARIA.

CAMPHORIC ACID.

NITRATE OF SILVER.

PICRIC ACID.

ALVELOZ.

CANTHARIDES.

THAPSIA.

ZINC OXIDE.

OINTMENT OF ZINC OXIDE.

ADEPS.

LANOLIN.

PILOCARPUS.

PILOCARPUS JABORANDI.

Synonym—Jaborandi.

Part Employed—The leaflets.

Natural Order—Rutaceæ.

Locality—Brazil.

Botanical Description—Jaborandi is a generic name for several plants possessing diaphoretic properties. *Pilocarpus jaborandi* and *pilocarpus selleanus* are the principal sources of the jaborandi of commerce.

The *pilocarpus jaborandi* is a shrub growing in the neighborhood of Pernambuco in Brazil; stem erect, four to five feet high, smooth, with gray and white dots; root three-fourths of an inch thick; leaves imparipinnate, one to one and a half feet long, two to ten pairs; leaflets petiolate, four to five inches long, one to one and a half inches wide, coriaceous, oblong-lanceolate, emarginate, unequal at the base, mid-rib prominent on the lower surface, veins anastomosing near the margin, pellucidly-punctate, dull-green, entire, revolute; flowers small, purplish, on long racemes; fruit in five carpels, dehiscing into two valves; seeds black, shining, reniform, one for each carpel; taste bitter, pungent. Solvents, alcohol, water. Dose, from fifteen to thirty grains

CONSTITUENTS—Pilocarpine, jaborine, volatile oil, tannic acid, volatile acid, potassium chloride.

PREPARATIONS—*Extractum Pilocarpi Fluidum*, *Fluid Extract of Pilocarpus*. Dose, from five to sixty minims.

Specific Jaborandi. Dose, from one-fourth of a minim to three minims.

Administration—In the administration of this agent the characteristic results may be obtained almost equally well, either from an infusion of the leaves, or from any of the preparations named. The hypodermic administration of the alkaloid pilocarpine, is preferable in many cases, especially where the promptness of its action is desired. The liquid preparations are often unacceptable to a disordered or sensitive stomach and then minute doses of the alkaloid in pellets or granules will be found a most desirable form for administration.

The action of the fluid extract or tincture of jaborandi and impure pilocarpine is sometimes disappointing, failing entirely to produce their characteristic influence and perhaps producing results contrary to those anticipated. This is due to the presence of the alkaloid, jaborine, which acts antagonistically to pilocarpine, having in its therapeutic influence many of the characteristics of atropine, an antagonist of pilocarpine. The **nitrate and hydrochlorate of pilocarpine** carefully prepared are free from jaborine and are thus reliable in their action.

Solutions of pilocarpine should be made fresh when needed as the salts decompose in aqueous solution. They are not permanent but will precipitate at once in alkaline solutions.

Physiological Action—Near the point of the administration of a hypodermic injection of the alkaloid, a few drops of sweat appear within from four to six minutes after the injection, to be immediately followed with moisture on the forehead, neck and chest, and in quick succession the entire body is bathed with a most profuse perspiration.

It is a powerful anti-diphtheritic and sialogogue, acting profoundly as a stimulant upon the secretions of the entire glandular system. No one known remedy stimulates every secretion of the body simultaneously as profoundly as does this agent.

The depression of the agent should not be allowed to progress; after the sweating has continued a few minutes profusely, a little whisky, brandy, tincture of ginger, or tincture of capicum should be given in hot water, and occasionally repeated while the transpiration progresses. If the heart shows the influence of the depression, a hypodermic of strychnine may be given, or a few drops of the tincture of cactus, strophanthus, digitalis, or nux vomica. If it is desirable to stop the sweating abruptly, atropine hypodermically may be resorted to.

The extreme effects of the agent need not be obtained in many cases, but owing to the susceptibility of some cases a small dose will sometimes produce extreme results. It is safe to obtain these results in extreme sthenic cases—in robust patients. The reaction will be prompt and satisfactory.

Most observers state that it is best to quench the thirst with

weak coffee or milk and not with cold water. It is undesirable that the patient swallow the saliva when the agent is administered after the bite of venomous snakes or in threatened hydrophobia or if given as an antidote to poisons.

When the agent fails to act upon the skin it often expends its force upon the salivary glands, kidneys, stomach, intestines or lungs, producing extreme secretion or excretion from these organs. In some cases this agent produces nausea, vomiting, diarrhoea, contracted pupil, extreme weakness, dimness of vision, sighing respiration, palpitation and collapse; but these symptoms of alarming nervous depression rarely occur and are easily combated with atropine.

Specific Symptomatology—The direct indications for this agent are acute suppression of the secretions, especially of those of the skin in sthenic conditions usually with distress, elevation of temperature, sharp, hard pulse, dry skin, dry mucous membranes, constipation, and small quantity of urine with dark color and high specific gravity.

Contra-Indications—Jaborandi should be avoided in asthenic conditions, or where there is feeble or dilated heart, and in old people and young children. Its characteristic influence is not at all marked in infants. Proportionately larger doses must be given and the results are not satisfactory.

Therapy—At the onset of **acute** febrile and **inflammatory conditions**, especially if there be rigors, hot, full head, and a bounding, hard pulse, a foot bath of hot water and a full dose of jaborandi with proper supportive treatment subsequently will often end the attack pre-emptorily. The stage following the influence of the agent if the temperature has subsided, has all the conditions in which quinine works to its best possible advantage.

In febrile conditions where the agent is indicated and yet where from other conditions its profound effects are contra-indicated, excellent results may be obtained by its administration in smaller and frequently repeated doses. Here the alkaloid in small doses serves the best purpose. Pilocarpine in doses of the 1-100 of a grain will accomplish the result, or a smaller dose even may be often repeated.

The agent is a **heart sedative** of acknowledged ability and is reliable. It controls the heart's action, the pulse, and the temperature similarly to aconite or gelsemium, with either of which it may be well combined and its influences heightened by the combination. In febrile conditions where nervous complications are anticipated, and where spasm has occurred, it has a sedative and direct anti-spasmodic influence, operating synergistically with gelsemium or the bromides.

In **inflammations** of the **lungs** or **pleura**, with exudation, it promotes resolution and quickly removes the exudate. In

bronchitis with dry, irritable, or hoarse cough, with imperfect secretion, it acts admirably as an expectorant. It lessens the cough as well as influencing the temperature. In **laryngitis**, **tonsillitis** or **diphtheritis** it is used by many physicians as the most important factor in the treatment. It is especially indicated in **stridulous laryngitis**.

In the treatment of **epidemic influenza** it has been given in small doses with persistency. It is said to render important service in the cure by restoring secretion.

In laryngeal **diphtheria** and in **membranous croup**, given in doses of from two to five drops every two hours, in conjunction with antiseptic treatment, it increases the mucus and salivary secretions and loosens the membrane and causes its exfoliation promptly and satisfactorily. It can be relied upon if the forces of the system can be sustained and if it does not produce too great protraction. Feeble children will not do as well under this treatment as robust and vigorous ones.

In **bronchial asthma** or in dyspnoea, from acute pulmonary engorgement, it gives prompt relief.

The agent in doses of from one-half to one drop often repeated during the afternoon or evening has controlled most satisfactorily the **night sweats** of slow convalescence and of pulmonary phthisis.

The agent has been used in **hydrocephalus**, and in other effusions into the membranes of the brain or spinal cord, but there are apt to be contra-indications and it must therefore be used discreetly, and combined with other agents as indicated, and the strength of the patient supported.

It is useful in all local or general **dropsies** with discriminating judgment in its administration.

In acute inflammatory **rheumatism** or in rheumatic fever it should not be neglected as few agents will take its place. It will be indicated during the course of chronic rheumatism as its influence in eliminating urea, uric acid and other morbid products is of excellent service here. It may be given in full doses once or twice each week or oftener, in much the same manner as a Turkish bath would be administered. Its influence is much wider than any baths.

In **acute mastitis** with suppression of milk after confinement it quickly relieves congestion and restores the lacteal secretion. It is a prompt and efficient **galactagogue** at any time. Sufficient doses to induce active transpiration need not be given, but five to ten drops of the tincture four times daily for a few days will accomplish the result. If the milk is entirely suppressed it may sometimes be restored if this remedy is administered immediately. In such a case a full dose should first be given, followed subsequently by smaller doses at longer intervals.

It has been used to advantage also in acute orchitis, and it

will serve a good purpose in some cases of acute **ovaritis** or **metritis**.

A writer in the Medical and Surgical Reporter says that having observed that **parturition** progresses most favorably when there is diaphoresis, he now produces that condition early by the use of jaborandi; he gives one-third of a teaspoonful of the green fluid extract in half a wineglassful of water every half an hour until perspiration occurs. The effect is a soothing one, often relieving the severity of the pains. The os rapidly dilates, the soft parts assume a more favorable condition, and the labor is soon terminated favorably. He has seen only good results from its use.

If prostration occurs from the profusion of the perspiration the skin is thoroughly dried, the patient is given a stimulating drink and warmly covered, and there are no further unpleasant results. It does not necessarily increase the danger of post-partum hemorrhage unless the effect of the agent is severe, in which case a full dose of ergot at the completion of the second stage of labor or a hypodermic of strychnia will insure prompt uterine contraction.

These facts are especially true if during confinement the skin is hot and the os unyielding, rigid and painful, the pains hard and unsatisfactory, the pulse sharp and hard, and perhaps the temperature rising. A full dose of jaborandi will often change the entire condition, at once producing relaxation of the os, free secretion, more expulsive and less irritating pains and a general soothed and quiet condition.

Many writers confirm the value of this agent in **puerperal eclampsia**. A French authority treated ten consecutive cases with satisfactory results, with the hydrochlorate of pilocarpine. He concludes that feebleness of the pulse, as long as the convulsions reappear, is not a contra-indication to a repetition of the dose.

When permissible it should be given in a single, full, prompt dose. Its best influences are directed toward elimination of the urea, thus relieving the uræmia and reducing dropsical effusions. Its anti-spasmodic influence, while not always, perhaps, to be depended upon alone, is exercised harmoniously with the indicated anti-spasmodic, whether it be veratrum, chloral, the bromides, morphia, passiflora or gelsemium.

In **exanthematous fevers** of all kinds jaborandi in small doses is the remedy *par excellence*. In robust cases, with scarlet fever, the determination to the skin and the elimination from the skin is so prompt and efficient that post-scarlatinal nephritis need not be anticipated.

Waugb is authority for the statement that the agent is efficacious in acute **sthenic erysipelas**. It may be given in twenty drop doses, every four hours, and any prostrating influences

antagonized. Local applications should not be neglected, but should be selected with care, and prompt tonics and restoratives should be administered in conjunction. In asthenic cases the agent should not be unqualifiedly discarded, but it may be adapted in small doses to the case in hand.

Pilocarpine has a selective action for the skin, and is prescribed by specialists in a number of skin diseases, notably in pruritus, eczema, prurigo, and in hyperidrosis pedum. It is given in small doses long continued.

Its continued internal use for other conditions has been known to result in an increased growth of the hair with **restoration** of the original color of **gray hair**.

Pilocarpine in the proportion of two grains to the ounce of lanoline is a common application to the scalp to restore the hair and prevent baldness. It may be combined with cantharides.

Ophthalmologists claim excellent results from its use in a number of diseases of the eye. In iritis it overcomes inflammations and removes adhesions. It causes rapid absorption of all exudates. It is of benefit in detachment of the retina and in optic neuritis. In all inflammatory conditions it is of service. It is beneficial after extraction of the lens, and is said to promote the absorption of opacities in the vitreous humor which have resulted from recent infiltration. It acts upon the pupil much after the manner of eserine.

A few doses of from twenty to thirty drops of jaborandi are given internally in cases of severe rhus poisoning, combined with proper external applications.

In the treatment of the **bite** of **venomous snakes** and in anticipated hydrophobia, and in poisoning from canned fish and other meats—in ptomaine poisoning, the salts are administered in maximum doses.

The patient will show but little of the prostrating influences of the drug. It is eliminative in its influence, only the poison must be antidoted by the proper remedy, and in organic poisons the permanganate of potassium is an efficient remedy.

SERPENTARIA.

ARISTOLOCHIA SERPENTARIA.

Synonym—Virginia Snakeroot.

Part Employed—The rhizome and roots.

Natural Order—Aristolochiaceæ.

Locality—United States.

Botanical Description—Virginia Snakeroot is a perennial, herbaceous, downy plant, with several erect, zigzag stems about a foot high, growing in rich woods, from Connecticut to the Mississippi and south to Louisiana, flowering from April to July; stem simple, branched, slender, round, flexuose, jointed

at irregular distances, reddish or purple below; leaves alternate, petiolate, oblong-cordate, acuminate, entire, pubescent, thin, pale-green, two or three inches long; flowers all next the root, curved like the letter S, contracted in the middle and at the throat, have a leathery texture, brownish-purple; anthers twelve; fruit corpuscle hexagonal, six-celled, with numerous small, flat seeds; rhizome one inch long, one-eighth inch thick, bent up and down, with stem remnants above, below and on the sides numerous rootlets, four inches long, yellowish-brown; odor camphoraceous; taste bitter, aromatic, terebinthinate. Solvents, alcohol, water. Dose, from five to thirty grains.

CONSTITUENTS—Volatile oil, aristolochine (bitter principle), resin, gum, starch, albumen.

PREPARATIONS—*Extractum Serpentariæ Fluidum*, Fluid Extract of *Serpentaria*. Dose, from ten to thirty minims.

Specific Serpentaria, Dose, from one to sixty minims.

Therapy—Its **diaphoretic action** in the **suppression** of the secretions from **cold**, in sudden, acute inflammation, and in the early stages of **acute fevers**, is most strongly marked. It is valuable, also, in the advanced stages of fevers where there is persistent suppression of secretion, and where the prostration contraindicates active diaphoretics, etc. It exercises a tonic effect on the nervous system, while it promotes secretion. It is of much value during the progress of **typhoid fever**.

In **scarlet fever** and **measles** and in **small-pox** it is a useful remedy. It hastens a tardy eruption, and restores the eruption promptly if it has receded. It must be given in full doses up to a dram of the tincture. It acts as a mild restorative tonic at the same time.

It was popular among the older physicians as an active eliminative agent. It was used in **chronic ague** as an antiperiodic and tonic. It was claimed to supersede quinine in some cases; **cynanche maligna** has been cured by it; **scrofula** and evidences of blood dyscrasia are benefited by it. It is of use in **chronic rheumatism**, and combined with more active agents, in acute cases. It stimulates digestion in enfeebled cases, and encourages a better action from all the glandular organs.

ACIDUM CAMPHORICUM.

Synonym—Camphoric Acid.

Occurrence—Obtained by boiling camphor with nitric acid.

Description—It occurs in the form of scaly crystals, small and white without odor, slightly acid to the taste. Freely soluble in hot water, sparingly soluble in cold water also soluble in alcohol and ether.

Administration—Dose, from one to twenty grains. Large

doses are necessarily given in capsules unless dissolved in a large quantity of water.

Therapy—The agent acts specifically upon the skin and mucous membranes, controlling **excessive secretion**. Twenty grains of the acid taken an hour before going to bed will control some of the worst cases of **night sweats**. It is especially applicable in phthisis, but is also valuable in the profuse sweating that occurs during the recovery from prostrating fevers.

In **excessive mucous discharges** from whatever cause, it is a valuable remedy. A one per cent solution may be used in **nasal catarrh** as a douche, in **laryngitis** and in **bronchitis** and as an application in mild forms of sore throat.

ARGENTI NITRAS.

Formula— AgNO_3 ,

Synonyms—Silver nitrate, nitrate of silver, lunar caustic.

Occurrence—This salt is formed from the direct chemical reaction occurring between nitric acid and silver. The crystalline salt is fused and formed into pencils or moulds to form the stick caustic, to which is usually added five per cent of the chloride of silver to give it tenacity.

Description—It occurs in the form of transparent crystals tubular in shape, colorless when pure, but becoming discolored—dark gray or grayish-black, upon exposure to light. These have a strong, metallic, bitter taste, sharp and caustic; are odorless, neutral in reaction, freely soluble in water, but soluble in twenty-six parts of alcohol.

Physiological Action—The effect of the nitrate of silver upon the skin is to produce a black discoloration. It unites with albumen and fibrin producing definite chemical compounds. Solutions of the nitrate turn all organic substances black, and because of this fact it is used for making indelible ink. To remove these discolorations, a few drops of the tincture of iodine may be applied and subsequently a dilute solution of liquor potassæ.

The nitrate of silver undiluted is a powerful caustic, but superficial in its influence. It is actively astringent, without irritating properties. It is applicable to inflamed parts or membranes, and taken into the stomach produces a sense of warmth and ultimate irritation. Much of the salt is converted in the stomach into the chloride of silver. It forms peptonates and albuminates also, which are absorbed into the blood, where important changes from the influence of this agent occur. The red corpuscles lose a part of the hæmoglobin, the serum becomes darker and the blood more fluid. It increases the flow of the bile and impairs the general nutrition of the body.

Poisoning—In poisonous doses, it produces vomiting and purging with spasms of the abdominal muscles. There are violent nervous symptoms with convulsions and delirium, depression of the temperature and of the heart's action, failure of respiration and death.

Antidotes—A solution of common salt is the chemical antidote to this agent, the insoluble chloride of silver being formed. Opium in proper doses is given to relieve the gastric and intestinal irritation, and sweet oil in large quantities is also necessary. A solution of soap in water, or a very dilute solution of liquor potassæ, or a few drops of aqua ammoniæ in water, or in large draughts of milk are all of value. Stimulants are used hypodermically and heat is applied to sustain the temperature.

There is a chronic form of poisoning by this salt, in which the agent is permanently deposited in the skin, as well as in other of the tissues. The skin assumes a permanent blue color, varying somewhat, at times, according to the condition of the patient. This is due to the imperfect elimination of the salt from the body.

Therapy—Under the present enlightened condition of therapeutics, the use of this and similar agents internally, is unjustifiable, and is practiced only in ignorance of better remedies. It has been employed in small doses in ulceration of the stomach, and in catarrhal conditions of that organ and the intestinal canal. It is said to give relief in chronic gastric pain and to be of benefit in some forms of dyspepsia.

As a local application, for external use, the agent is manageable, and of much service. It is applicable to **chronic ulceration** of whatever character, especially of mucous surfaces. Carefully applied to **ulceration** of the os or **cervix uteri**, after these parts have been well cleansed, much benefit results.

In unhealthy granulation of wounds, known as proud flesh, this caustic is curative. In the proportion of from one to five grains in an ounce of water, it is useful in **ophthalmia neonatorum** and in **gonorrhœal ophthalmia**. It is also used in granulation of the eyelids and in some cases of **purulent conjunctivitis**.

It has been applied to **erysipelatous** surfaces, but the tincture of iron is a superior agent.

It is serviceable in dilute solution in the treatment of **leucorrhœa** of a specific or non-specific character, and in **gonorrhœa**, whether in the male or female.

It is also applicable to **abnormal growths**, some simple forms being aborted by it. It has been applied to felons in their early stages and to boils, before suppuration, with good results.

ACIDUM PICRICUM.

Synonyms—Picric acid, carbazotic acid, trinitrophenol.

Occurrence—This acid is obtained from the action of creasote upon nitric acid, or by dissolving pure crystallized carbolic acid in sulphuric acid and treating this product with nitric acid or with sodium nitrate.

Description—It is crystalline in character, light yellow in color, bitter, freely soluble in water, sublimes without decomposition, and explodes upon heating. Its salts of potassium and sodium are too unstable for use in medicine, being violent explosives, the ammonium salt alone being in common use.

Physiological Action—It acts as an irritating depressant. In poisonous doses, there is a reduction of temperature and blood pressure, shallow breathing, rapid, feeble heart action, great weakness, profuse diarrhœa with pain in the stomach and bowels, and collapse. In some cases convulsions occur followed by death.

It colors the serum of the blood, materially increases the white corpuscles and alters the character of the red blood cells. The action of the agent as a medicine is considered in the action of the picrates of ammonium.

Picric acid is used in the treatment of **superficial burns** by a number of eminent authorities, but in the treatment of extensive and deep burns, there is danger of poisoning. Sterilized gauze is soaked in a saturated solution of picric acid and laid over the entire burned surface, a light dressing is laid over this and the whole is retained by a light bandage. After three days it may be thoroughly moistened with a solution of the acid as it will become very dry, and may be removed. A second dressing may be applied as the first. It controls pain and rapidly promotes healing. When granulation is progressing, and pus no longer forms, it may be replaced by a simpler dressing.

In some cases the solution is simply brushed over the surface thoroughly, and gauze placed over it for a few days.

Stains from the use of picric acid may be removed by alcohol, a solution of boric acid, or a strong soap.

ALVELOS,**EUPHORBIA HETERODOXA.**

The milky juice of this plant is used in medicine. It is best preserved by the addition of salicylic acid. The addition of water to the juice precipitates a resin, which may be separated, dried and powdered. Three parts of the powder to one hundred parts of vaseline, make an active ointment.

Physiological Action—It is an exceedingly irritating sub-

stance and must be used with care, as, applied too freely over serous surfaces, it may induce inflammation.

The agent is mentioned as a remedy for **epithelial cancer**. The writer has known of its use in cases where nothing else availed, and where an operation had been performed, and the result was satisfactory. As an application only those specimens will be of benefit which will produce a copious and offensive discharge of the urine by their absorption, and influence on the kidneys. A case of uterine cancer is reported where one application each day caused the bleeding and pain to cease and permitted the general health of the patient to improve.

CANTHARIDES.

CANTHARIS VESICATORIA.

Synonyms—Spanish Flies, Blister Beetle.

Natural Order—Coleoptera.

Locality—Southern Europe and Western Asia.

Description—This insect is about one inch long, by one-fourth inch broad, somewhat cylindrical in shape, flattened; black above with brownish wings and long wing cases. The remainder of the body is of a shining dark-green color. The powder has a strong, disagreeable odor, and a slightly acrid taste. Solvents, alcohol, chloroform. Dose, from one-eighth to one grain.

CONSTITUENTS—Cantharidin, extractives, salts and fat.

Cantharidin is a crystalline body obtained by exhausting the powder with chloroform. The crystals are colorless prisms, soluble in alcohol, chloroform, ether and in volatile oils, and to a limited extent in water. It is the irritating, blistering constituent of the powder.

PREPARATIONS—Tinctura Cantharidis, Tincture of Cantharides. Dose, from one to ten minims.

Specific Cantharis. Dose, from one to five minims in water.

With many physicians the agent is always prescribed in small doses frequently repeated—from five to fifteen drops in four ounces of water, a teaspoonful every one, two or three hours.

Ceratum Cantharidis—Cantharides cerate, made of cantharides, yellow wax, lard and turpentine.

Physiological Action—Internally the agent will produce gastro-intestinal irritation, pain, nausea, vomiting, bloody stools, suppression of urine, with irritation in passing, strangury, swelling of the external genitals, general depression, convulsions and death. It increases sexual desire, and is an active emmenagogue and abortifacient.

Applied externally the agent produces at first, local stimulation, a reddening of the skin and subsequent vesication, the

vesicles filling with serum, producing prompt and marked derivation and general depression.

Therapy—In small doses this agent is in use in the treatment of **cystitis** and **bladder irritations**, accompanied with tenesmus and constant desire. It is serviceable in **enuresis** when there is **relaxation** of the **bladder walls**, and lack of control of the sphincter, especially in that common to relaxed plethoric women, when upon their feet, and when coughing.

It is of some benefit in the treatment of **dropsies**, especially of those following scarlet fever, and diabetes in its later stages.

It is occasionally beneficial in **eczema** and **acne**, when accompanied with uterine or vesical irritation, or with **amenorrhœa**. In small doses it is prescribed in **sub-acute** or chronic **gonorrhœa** or **gleet**.

As a vesicant, or blistering agent, Cantharides has long been used in the treatment of **local inflammations** of all characters, usually in sthenic stages, as its derivative influence produces debility. **Diseases of the brain** and **spinal cord**, and their meninges, have been treated with extreme derivation from its action and often with good results. As a local stimulant in **hypostatic congestions** the agent has been much used, being applied in such cases short of vesication.

Strangury induced by the use of this agent may be treated by the use of a solution of potassium hydrate in frequent doses from ten to twenty drops freely diluted.

Note—Powerful vesication is seldom deemed advisable by our physicians as local stimulation by heat or mustard is usually found sufficient. The formation of large blisters or blebs is deprecated, as inducing depression and local pain and general irritation, usually out of all proportion to the benefit derived. The abstraction of the serum from the blood, which contains almost as much albumin as the blood itself, amounts to but little less than actual blood letting. Extreme blistering, even by physicians addicted to most heroic measures is largely relegated to the past.

When counter irritation, derivation, or local stimulation seems to be needed, we have recourse to local heat, dry or moist, always short of burning, mustard, capsicum, and other agents named in other chapters for their revulsive action, as croton oil, and other oils, chloroform, ether and ammonia, confined.

THAPSIA.**THAPSIA GARGANICA.**

Part Employed—The root.

Natural Order—Umbelliferæ.

Location—Southern Europe and Northern Africa.

It derives its name from the Island of Thapsos where it grows abundantly.

Botanical Description—A perennial herb, with a smooth, thick, hollow stem; the leaves are shining, with large sheaths; the leaflets are acute with two or three lobes and the flowers are in large, yellow compound umbels; the root is from one and one-half, to two feet long and two or three inches thick, tapering and branched, white on the inside, and brownish externally; odorless, with an acrid, biting taste.

PREPARATIONS—The active principle is a resin. It has for some years been recognized in the French Pharmacopœia as an important agent. The medicinal virtues are found in the entire plant, but the bark of the root is recognized as best yielding these virtues. It is digested in alcohol and the residue evaporated to a soft mass, from which the plaster is prepared. The official plaster is made of wax, turpentine and colophony into which is incorporated seven per cent of the resin. If prepared in a less percentage than this it is slow in action and less satisfactory.

Physiological Action—The agent is a prompt vesicant and an exceedingly active counter-irritant. In certain cases it is singularly valuable, but the plaster must be an active one and its full influence should be obtained in from four to six hours. If it acts mildly and slowly much less good will result.

There is no pain, but in most cases an intolerable itching and if the surface is not scratched or irritated there is no spreading. It is sometimes necessary to cover the surface to prevent irritation, which may be allayed in a short time by the application of a starch paste, or by the use of the glycerole of starch.

In a few patients, especially those of a sanguine temperament, with sandy or red hair, its prolonged use will produce a mild inflammation of the skin, with much redness and swelling. If the irritant is continued, violent inflammation and pustulation will follow. The patient must be cautioned against scratching the irritated skin, as this spreads the irritation actively to all contiguous surfaces. If inflammation or spreading occurs, it can be readily controlled by a soothing antiseptic dressing or by the application of an elm poultice.

It produces in a few hours an immense crop of small, miliary vesicles upon a reddened skin. As soon as these appear distinctly, the plaster should be removed, as they will rapidly increase in size and pustulation will occur. They often increase for a short time after the plaster is removed.

Therapy—In stubborn, **bronchial disorders** Thapsia has produced immediate and permanent benefit. It is valuable in **chronic lung troubles**, especially where there is effusion or probability of suppuration. If the plaster is of French manufacture, six hours is a sufficient time in which to obtain its full effects, but if of American manufacture, it will require a longer time, but may be equally satisfactory. It can be relied upon wherever a strong, revulsive influence is required, and can be used in chronic inflammation of any organ, or, in fact, wherever cantharides is indicated this remedy will induce better results, without the drain upon the system induced by the latter named agent.

The application of a Thapsia plaster will often cure persistent cases of **sciatica**, even when other measures have signally failed. In **neuralgia** of any kind it is of service and will be found beneficial in some cases of muscular rheumatism.

Because of the exceedingly irritating character of this agent, but little use has been made of it internally, and yet some excellent authorities claim much benefit from its action. Dudgeon speaks of this agent as a remedy for certain urinary conditions. He says it is a powerful anti-hemorrhagic and has a marked influence in correcting the uric acid diathesis. Rademacher prescribed thirty drops of the tincture five times daily in a case of **dropsy** with **hæmaturia**, both conditions disappearing promptly with the discharge of a large quantity of renal sand with the urine which was greatly increased in amount. A pupil of Rademacher gave the same dose to a woman suffering from **strangury**. She could not retain the urine, which was turbid containing a red sediment and there was constant pain in the urethra, a cure resulting within one week.

Jousset has found the remedy useful in many forms of hemorrhage. Herr used it with success in the **painful urination** of **old people**, both with and without spasmodic retention. It apparently acts more satisfactorily where there is an excess of uric acid and in these cases it deserves further trial.

ZINCI OXIDUM.

ZINC OXIDE.

Synonym—Zinci Oxidum.

Occurrence—The oxide of zinc is prepared by heating the carbonate of zinc in a crucible to a red heat.

Description—It is a white amorphous powder, odorless and tasteless. It is insoluble both in water and in alcohol.

Administration—Although at one time quite generally used its use in medicine is now limited. It is given in doses of from one-fourth to four grains in pill form.

Therapy—It may be given in exactly the same conditions

for which the sulphate is given, except as an emetic. It has antispasmodic properties and its principal use is in this line. It is valuable for external use in the form of an ointment as is stated under the proper title.

UNGUENTUM ZINCI OXIDI.

Synonym—Ointment of Zinc Oxide.

Occurrence—This long known and popular ointment is made by thoroughly combining eighty grains of the pure oxide of zinc with one ounce of benzoated lard.

Therapy—It is useful in **cutaneous eruptions** of all characters, as it is non-irritating and promotes rapid healing. In ulcerations, in burns, and in **excoriation**, or in bruised conditions of the skin it is valuable. An ounce of this ointment combined with two drams of bismuth sub-nitrate is a most valuable dressing for **sore nipples**. It is excellent, also, applied to fissures, oozing surfaces, **eczema**, and ulcerations of the anus and rectum, and to **piles**, especially if of recent origin.

PREPARED LARD.

ADEPS PRÆPARATUS.

Synonym—Lard.

Occurrence—The purified adipose matter of the omentum and mesentery, and around the kidneys of the hog. *sus scrofa*.

The portion of fat selected is that known as leaf lard, and, for medicinal purposes, that of the hog fed on corn and killed during the winter months, should be selected. In the crude state it contains membranes, vessels and blood. To remove these, the fat, deprived of membranous matter as far as possible by the hand, is cut into small pieces and washed with water till the blood is thoroughly removed, and the water runs clear. It is then heated moderately in a tinned vessel till the melted fat becomes perfectly clear and free from water. It is then poured into glass, porcelain or other well glazed vessels impervious to fat, and hermetically sealed, as it becomes quickly oxidized, or rancid, on exposure to the air and is rendered unfit for medicinal use.

Description—Lard is a soft, white, unctuous solid, having a faint odor free from rancidity, and a bland taste, insoluble in water, very slightly soluble in alcohol, readily soluble in ether, chloroform, carbon disulphide or benzin. Its Specific gravity is about 0.932 at 59 deg. Fahr. It melts at 100 to 104 deg. Fahr. and forms a perfectly clear liquid, which is colorless in thin layers, and which should not permit the separation of an aqueous layer. At or below 85 deg. Fahr. it is a soft solid.

Distilled water boiled with lard should not acquire an alkaline reaction (absence of *alkalies*), nor should another portion be colored blue by iodine test-solution (absence of *starch*).

Benzoated Lard. When hog's lard is impregnated with benzoic acid, in the proportion of twenty parts of the latter to one thousand parts of the former, it is not so liable to become rancid.

CONSTITUENTS—Stearin (a solid), palmitin (a crystalline substance), and olein (a liquid—lard oil).

Properties and uses. Lard is employed in pharmacy as an ingredient of ointments and cerates; and in medicine as an emollient to protect tender surfaces from the irritant action of the air. For this purpose it may be given by enema in dysentery, and internally in diarrhœa, accompanied by inflammation of the membranes lining the bowels. Inunction of the whole body is a protective against taking cold in scarlet fever, and renders the patient less liable to have post-scarlatinal dropsy. The local application of lard to the chest in bronchitis, measles and catarrh is beneficial for a similar reason; while in coryza of infants anointing the bridge of the nose is a common practice, and tends to modify the disease.

In scrofulous affections the practice of anointing the whole body with lard has a favorable effect. For this purpose benzoated lard, with a sufficient quantity of glycerine to make it liquid, may be employed.

LANOLIN.

Synonyms—Adeps Lanæ Hydrosus. Hydrous wool fat.

Occurrence—The fat of the wool of the sheep, present in the proportion of forty-five per cent of the weight of the wool. It consists of a mixture of ethers of cholesterin and fatty acids, and may be obtained by treating the wool with petroleum benzin, afterwards distilled to expel the benzin.

Description—Lanolin, at ordinary temperatures, is a rather stiff but unctuous substance of a yellow or yellowish-white color, without odor, with a fatty taste, insoluble in water, but soluble in ether and chloroform. It may be mixed with twice its weight of water, or with aqueous preparations without losing its ointment-like character.

Therapy—As an ointment base, this substance is absorbed by the skin more rapidly than any other known base, facilitating also the absorption of the medicinal constituents of the ointment of which it forms a part. This author has proven this to his complete satisfaction in hundreds of cases, notwithstanding the statements of foreign experimenters, that it has no superior influence. It is soothing to the skin and healing to a

remarkable extent and perceptibly promotes the growth of hair. An ointment, of which this is the base, applied to a given surface for thirty days will show a marked increase in the growth of the hair as compared with that on the surrounding surface.

GROUP VIII.

Agents Acting upon the Female Reproductive Organs.

BLACK HAW.	ALETRIS FARINOSA.	GOSSYPIMUM.
VIBURNUM OPULUS.	CAULOPHYLLUM.	TIGER LILY.
SENECIO AUREUS.	POLYGNUM.	CYPRIPEDIUM.
HELONIUS.	LEONORUS CARDICA.	ARALIA.
MITCHELLA.		

BLACK HAW.

VIBURNUM PRUNIFOLIUM.

Part Employed—Bark of the root.

Natural Order—Caprifoliaceæ.

Location—United States.

Botanical Description—A tall handsome shrub or small tree indigenous to the northern, eastern and southern portions of the United States, growing to an extreme height of twenty-five feet and with a diameter of five to six inches. Often shrubby, low, much branched and not above ten feet in height. The wood is hard, heavy, strong and close-grained, of a reddish-brown color.

Its distinguishing features are the perfect flowers, its leaves opposite, broadly oval, obtuse, finely and sharply serrate, shining above, petioles naked and cymes sessile. The smaller leaves are about one inch long, the larger ones nearly three inches in length and from one-half to one and one-half inches wide. The petioles are sometimes on strong shoots narrowly margined, rufous, pubescent. Inflorescence in compound cymes of from three to five rays subtended by upper leaves, many flowered, drupes are large, oval, one-half inch long, edible, of a sweet taste when ripe, black or bluish with flat stone; the bark of the root is fawn-colored externally, odor feeble, bitter

taste, astringent; dried root is in thin quills, glossy, purplish-brown, with scattered warts, blackish dots, and irregular lines; corky layer is easily removed from the green outer bark; inner bark white, smooth, fracture short. Solvents, dilute alcohol, boiling water. Dose, from half of a dram to a dram.

CONSTITUENTS—A brown resin, viburnin, valerianic, tannic, oxalic, citric and malic acids, sugar, earthy carbonates and phosphates.

Viburnin, a greenish-yellow, bitter principle, resinous, soluble in alcohol, sparingly soluble in water.

PREPARATIONS—*Extractum viburni prunifolii fluidum*, fluid extract of *viburnum prunifolium*. Dose from half a dram to one dram.

Specific *viburnum*. Dose, from five to sixty minims.

Therapy—The influence of *viburnum* is exercised upon the womb, regulating its function and soothing irritation. The agent has not had thorough study to determine its exact physiological action. It however exercises its influence through the nervous centers, soothing nerve irritation and possessing marked antispasmodic properties. It influences the motor side of the cord, producing progressive muscular weakness, loss of reflex action and ultimate paralysis. It apparently directly influences the action of the heart, as it lowers arterial pressure to a marked degree.

Its sedative influence upon the nervous system is conveyed to the uterus and appendages and there becomes apparent. It overcomes all forms of nervous irritation, and irregular functional action in these organs. It is the direct remedy for nervous conditions of the pregnant state.

It is a most excellent remedy in dysmenorrhœa, especially that characterized by cramp-like pains of spasmodic character. It promotes normal uterine contractions and antagonizes those of an irregular character. It is valuable in menorrhagia and metrorrhagia, either of an acute or a passive character. In all of these cases its use should be begun a few days in advance of the anticipated disorder and continued through and beyond the menstrual period.

Viburnum prunifolium is especially a uterine sedative in **threatened miscarriage**. It is particularly indicated in **habitual abortion**, preventing an anticipated occurrence, and permanently overcoming the habit. The author has had practical experience extending over twenty years, and has perfect confidence in the agent based on repeated success. In one of his cases it caused the womb to suspend expulsive action and to retain a dead foetus for months; given in large doses after the fourth month no return of the expulsive effort occurred until the seventh, when the agent was discontinued, after which a four-months mummified foetus was expelled without detriment to the health

of the patient. The agent, when there is no habit of abortion, will probably accomplish the desired result if begun after hemorrhage has continued some hours, if the membranes are not detached or the sac ruptured.

Doses of one dram of the fluid extract every hour are necessary until the pain subsides or the flow ceases. The patient must be kept in a recumbent position and perfectly quiet. It is safer to begin either preceding, or with the flow in these cases.

In habitual cases it is necessary to give the agent in occasional doses for one, two or more weeks preceding the time of the miscarriage, which usually occurs each time at the same month of the foetal life. As the time approaches the patient is kept quiet and free from excitement, and the agent is given three or four times daily. The interval is shortened to one or two hours with the first suspicious indication at the usual time. If no symptoms appear the agent is continued beyond the period, and then perhaps in daily doses only for a week or two longer. The physician should advise the patient to remain constantly on the watch for indications suggesting the necessity of an increase in the doses. The agent will stop **induced miscarriage**, as well as other forms, if no injury has been done to the membranes.

In small doses, it is an excellent **partus preparator**, materially improving the conditions when irregular and distressing symptoms are present and greatly facilitating a speedy and uncomplicated normal labor. It controls **after pains** and prevents **post-partum hemorrhage**. It insures normal **involution** and assists in retaining a normal position of the womb subsequently, where malposition had previously existed.

In its influence in overcoming reflex nervous disturbances, it is often most efficient in controlling the **morning sickness** of pregnancy and the entire train of distressing symptoms present at this time. It changes the mental condition of the patient from that of depression and despondency, to one of cheerfulness and hopefulness.

There is probably no proprietary remedy advertised for female complaints, and for promiscuous use in cases of this character, that does not contain viburnum prunifolium as the basic remedy. Its field of usefulness is a wide one as far as the genito-urinary apparatus is concerned.

It is the remedy for **sympathetic disturbances** of the heart, stomach and nervous system, common to sensitive ladies with irritable nervous systems, preceding or during the menstrual epoch, depending on vasomotor derangement. It must be given in advance and continued through the period.

In a number of cases, when given for menstrual irregularities, or for the distress induced by **uterine displacement**, in previously **sterile females**, pregnancy has promptly occurred,

proving the influence of the agent in restoring normal functional ovarian activity.

It must not be overlooked in the treatment of **irregular, sudden, menstrual flow**, occurring during eruptive and low continued or violent inflammatory fevers, especially in young ladies. This occurrence is not uncommon in small pox, scarlet fever, diphtheria, measles, pneumonitis, pleuritis, phthisis and typhoid fever. It is sometimes of serious import, and masked sepsis undoubtedly occurs in some cases, with severe peritonitis or metritis, to which the patient may succumb. With antiseptic douches and disinfectant measures, viburnum internally is the surest remedy known, in this condition. It is given in conjunction with other indicated remedies, and its use must be begun promptly upon the appearance of the flow.

It is mildly efficacious in irregular muscular movements, in **chorea**, especially if occurring from early menstrual derangement, and in some cases of **paralysis agitans**.

It is advised in **hysteria, hystero-epilepsy**, and **petit mal**. It will act in harmony with cimicifuga and passiflora and the bromides in these cases. It is an agent of great usefulness, and its field broadens with every practitioner, as his knowledge of its influence increases with practical experience in its use.

VIBURNUM.

VIBURNUM OPULUS.

Synonyms—Cramp Bark, High Cranberry, High-bush Cranberry.

Part Employed—The bark.

Natural Order—Caprifoliaceæ.

Locality—New Brunswick and other portions of Eastern North America.

Botanical Description—A large bush eight or ten feet in height, with serrate, three-lobed leaves, broader than long, lower ones pointed; petioles glandular; cymes pedunculate with border of large, white flowers; fruit a one-seeded drupe, resembling the cranberry; bark brownish or ashen-gray in quills or curved bands.

PREPARATIONS—Fluid Extract High Cranberry. Dose, from ten to thirty minims.

Specific Symptomatology—The specific influence of the agent is exercised in relieving **irregular spasmodic pains** of the **womb** and **ovaries**. It is antispasmodic in its action upon the entire pelvic viscera, influencing **spasmodic contractions** of the **muscular structure** of the **bladder**, and **spasmodic stricture**, to a limited extent.

Therapy—Given prior to labor it is a **partus preparator** of much value, but its action is limited largely to its antispasmodic

influence upon **erratic pains**. It is given with much benefit in severe after-pains, in **hysterical conditions**, with convulsive phenomena, and in **spasmodic dysmenorrhœa**. It is of advantage in that it prevents miscarriage, but to an extent greatly inferior to *viburnum prunifolium*, which agent, in fact, fully covers the field of operation of this agent, except in its anti-spasmodic influence.

SENECIO.

SENECIO AUREUS.

Synonym—Life root.

Part Employed—The whole plant.

Natural Order—Compositæ.

Locality—United States.

Botanical Description—*Senecio Aureus* is a perennial plant growing in moist places in the northern and western parts of the United States, and flowering in May and June; stem erect, smooth, striate, one to three feet high, simple, cottony when young, growing smooth with age, simple or branched above; leaves from the root crenately toothed and heart-shaped stem, leaves lyre-shaped or pinnatifid, usually lanceolate, sessile or partly clasping, corymb umbel-like with many flowered heads, and bright-yellow florets; rhizome horizontal with many slender rootlets; taste bitter, acrid. Solvents, alcohol, water. Dose, from five to forty grains.

CONSTITUENTS—A bitter, acid principle, tannin, mucilage.

PREPARATIONS—*Extractum Senecionis Fluidum*, Fluid Extract of *Senecio*. Dose, from half a dram to one dram. Specific *Senecio*. Dose, from one to forty minims.

Physiological Action—Its specific influence is exercised upon the reproductive organs of the female, whether there be **amenorrhœa**, **dysmenorrhœa**, **menorrhagia** or **metrorrhagia**—a disordered condition of the uterine functions—it is regulated by this agent; a general out-of-tone condition of the uterus or appendages, a relaxed condition of the supports to the womb, resulting in mild forms of displacement. It may be given between or during the menstrual periods. In a general hyperæmic, irritable and atonic condition of the pelvic organs, it works to the best advantage. The results are not immediate, but they are marked when they do occur.

It is of value in engorged, **atonic conditions** of the **male sexual organs** also; it increases functional activity, and is of value in **impotency**, although not actively so. It is an active diuretic, and adds tone and increases the function of the urinary apparatus, and overcomes urinary irritation; in stranguary it has a direct influence.

Therapy—The agent is specifically a **tonic** to the nervous

and muscular structure of the **reproductive organs** in the **female**. It regulates the **periodical discharges**, overcoming irregularity in the quantity of the monthly flow. It will render valuable assistance in the permanent cure of **leucorrhœa**. It removes the sensation of weight and engorgement experienced by many ladies in pelvic disorders, especially accompanying uterine displacements, giving great relief.

It will be found of value in **gonorrhœa**, **gleet** and **prostatorrhœa**, and also in the sexual irritability and impotence of the male.

Senecio has an influence on the mucous surfaces, relieving congestion and correcting catarrhal disorders. It **assists digestion**, stimulates the secretion of gastric fluids and overcomes the conditions which cause the food to lie heavily in the stomach. In the accumulation of frothy saliva it is useful, and in a constipation accompanying uterine disorders it is especially valuable.

The agent has exercised an active influence in a number of cases of **capillary hemorrhage**. It has been given in **hæmaturia** in spoonful doses of the fluid extract, three or four times a day, with positive results. In **albuminuria**, with occasional attacks of hæmaturia, especially if occurring during pregnancy, the agent will act promptly. In hemorrhage of the lungs, or from the stomach of a passive character, it will work well. In **menorrhagia** or **metrorrhagia** it is directly indicated.

Co-operatives—It acts in harmony with viburnum, helonias, aralia, mitchella repens, and other agents of this character.

HELONIAS.

HELONIAS DIOICA.

Synonyms—Chamælririum luteum (Gray), starwort.

Part Employed—The root.

Natural Order—Liliaceæ.

Locality—United States.

Botanical Description—*Helonias dioica* of Pursh, *veratrum luteum* of Linnæus, *melanthium* of Walter and *chamælririum luteum* of Prof. Gray, is a herbaceous perennial of the lily family, growing in low, moist ground, east of the Mississippi, and flowering in May and June; stem one to three feet high, simple, smooth, angular; leaves alternate, spatulate below, lanceolate above, radical leaves eight inches long and half an inch wide, narrow at the base and formed into a sort of whorl; flowers small, very numerous, greenish-white, bractless, dioecious, in a dense terminal raceme, nodding, like a plume, six inches in length, more slender and weak on the barren plants; petals of male flowers narrow, stamens longer than the petals; filaments tapering; anthers terminal, two-lobed; petals of female

flowers linear; stamens short; ovary ovate, triangular furrowed; stigmas three, capsule oblong, three furrowed, opening at the summit; fruit, many, compressed, acute; rhizome somewhat bulbous, terminating abruptly, as if bitten off, one inch long and one-fourth inch in diameter, somewhat curved, dark, gray-brown color, closely annulated from leaf-scars above and root scars or wiry rootlets below, breaks with a smooth fracture, with vascular bundles near the center, with a few which pass into the rootlets near the surface; odor faint, taste bitter. Solvents, alcohol, water. Dose, from twenty to forty grains.

CONSTITUENTS—Chamælirin, fatty acid.

PREPARATIONS—Extractum Heloniatis Fluidum, Fluid Extract of Helonias. Dose, from five to thirty minims. Specific Helonias. Dose, from one to twenty minims. Helonin. Dose, from two to five grains.

Physiological Action—Helonias in large doses is a cardiac poison. In medicinal doses it is emetic, tonic, diuretic, vermifuge. Cattle are killed by feeding on it and the decoction will kill insects.

Specific Symptomatology—The most direct indication for the use of this agent is a dragging sensation in the extreme lower abdomen, and inclination to pull up, to hold up, or support the abdominal pelvic contents. In women suffering from pelvic engorgement and uterine prolapsus, with disordered menstruation, one drop of the tincture or fluid extract every two or three hours will relieve that sensation permanently,

Therapy—It is most serviceable indeed in **female disorders**. In **prolapsus** alone, or combined with senecio aureus, cimicifuga, viburnum, or hydrastis, as indicated, it has no superior. If mental depression and anxiety are present it will work happily with pulsatilla.

In addition, it is a general tonic improving the character of all the organs in their functional operations, and especially improving the tone of the **digestive apparatus**. It is a liver remedy of rare value, in many cases accomplishing most satisfactory results when there is deficient or perverted action.

If the sensation of dragging and weight occurs in the male from cystic disorder, the relief is fully as satisfactory. The general action of the agent in these cases is that of a **tonic** to the **genito-urinary** apparatus. It quickly overcomes the phosphatic diathesis, and in urinary irritability is serviceable, especially if from atonic causes. It is useful in impotence, its properties as an aphrodisiac having been often noted.

A number of our physicians have spoken most highly of its action in **albuminuria**. It will be found valuable in those cases where the cause is some fault of the liver, as deficient action of that organ, and not due to heart or circulatory faults. Dr.

Munn of Connecticut, has advised it after a long personal experience in its use in kidney disease.

MITCHELLA,

MITCHELLA REPENS.

Synonyms--Partridgeberry, Squaw Vine.

Part Employed—The whole plant.

Natural Order—Rubiaceæ.

Locality—United States.

Botanical Description—*Mitchella repens* is a perennial ever-green herb, growing in moist places and flowering in June and July; stem creeping, branched, ten to twelve inches long, smooth; leaves opposite, petiolate, ovate, half an inch long, entire, flat, coriaceous, dark-green, shining, marked with white lines; flowers in pairs at the end of branches, white or purplish, often diœcious, bearded inside the corolla, which is funnel-shaped, fragrant, ovaries united; calyx four-parted; stamens four, inserted in the corolla; style slender; stigmas four; fruit a scarlet-red berry with two united ovaries, with four little stones, or seeds, to each flower; stipules small, not fringed; leaves inodorous, astringent, bitter. Solvents, alcohol, boiling water. Dose, from a half to one dram.

CONSTITUENTS—Saponin-like body, resin, wax, dextrine, mucilage.

PREPARATIONS—Specific *Mitchella*. Dose, from five to sixty minims. *Syrupas Mitchellæ compositus*, compound syrup of *Mitchella*. Dose, from one to two drams.

Therapy—The sphere of action of *Mitchella* is upon the reproductive organs, particularly upon those of the female. It is not enlarged upon by our writers, but is known positively to a few practitioners. The importance of removing every possible influence that increases in any way the severity of **labor**, does not impress itself upon physicians, unless an exceedingly severe labor is anticipated, when the excess of pain is alleviated at the time by chloroform and morphine. Not only can all complicating influences be removed, but the nervous system can be so influenced that parturition to the mother can be shorn of dread and terrors, and can be looked forward to without anxiety or fear. We are so apt to think of the pain and horror of labor as a natural inheritance for each mother—something that she must expect, and should not try to shun, that we do not take the care we could in many cases, to shield her from it.

If a good preparation of *Mitchella* be administered once or twice daily for the last three months of pregnancy, three times daily for the last month, and in larger doses as confinement approaches, the influence upon the entire system will be most

marked. Erratic pains and unsatisfied longings are removed, the nervous system assumes tranquil condition, reflex symptoms abate, the urinary function is performed normally, the bowels become regular, imperfect digestion is improved, and the appetite becomes natural. Labor approaches devoid of the irritating, aggravating complications; the preparatory stage is simple, the dilatation is completed quickly, the expulsive contractions are strong, unirritating, and effectual, and are much less painful than without the remedy, involution is rapid and perfect, there are no subsequent complicating conditions to contend with, the patient's strength is not abated, and the function of lactation is in its best condition. This has been proven in very many cases.

Auxiliary measures such as judicious dieting, a thorough oiling of the enlarged abdomen, and an occasional hot sitz bath for the last few weeks will materially assist the remedy. Less of it need be taken.

The bark of the fresh root in hot infusion given occasionally during the progress of labor when no previous care of the patient has been afforded the physician, will work wonders in some tedious aggravating cases.

In **uterine disorders** at other times this agent is a most effectual remedy. It overcomes painful menstruation, regulates the function, relieves congestion in the pelvic organs and soothes general irritation of the nervous system from uterine or ovarian causes.

Co-Operatives—It works harmoniously with cimicifuga, pulsatilla, aletris, helonias, senecio aureus, and viburnum. Combinations of these agents compose the usual proprietary compounds, advertised as "female regulators."

ALETRIS.

ALETRIS FARINOSA.

Synonym—Star Grass.

Part Employed—The root.

Natural Order—Hæmodoraceæ.

Locality—United States.

Botanical Description—Aletris farinosa is a perennial plant with leaves springing from the root which spread out on the ground like a star; peduncle two to three feet high bearing a spiked raceme of whitish flowers; leaves radical, sessile, lanceolate, three or four inches long, one inch wide; flowers white, as though dusted with meal, each flower with a short pedicel and a minute bract; perianth bell-shaped, divided at the mouth into six spreading segments; stamens six; ovary three-lobed; capsule triangular, three-celled; rhizome premorse, one and a half inch long, one-eighth inch thick at the lower end, flattish

on the upper surface, lower end convex and beset with numerous simple rootlets, two to three inches long, glossy-black when old; four-jointed, brownish externally, white internally, fracture mealy, with protruding, scattered wood-bundles; taste bitter. Solvent, alcohol. Dose, ten grains.

CONSTITUENTS—Not analyzed.

PREPARATIONS—Extractum Aletridis Fluidum, Fluid Extract of Aletris. Dose, from ten to fifteen minims.

Specific Aletris. Dose, from one to sixty minims.

Action—Emetic, narcotic, cathartic, tonic.

Aletridin. Dose, from one-half to one grain.

Specific Symptomatology—The conspicuous influence of this agent is upon the womb. It is indicated when the patient complains of **extreme weakness** in the **uterine structures**, when there is general feebleness induced from overwork or from oversexual indulgence, or from too **frequent childbearing**. In hyperactivity of the womb and ovaries from lack of tone, deficient menstruation, or sterility from this cause, pale insufficient flow at protracted intervals; anæmia and chlorosis, with insufficient menses in young girls, the agent is of great service.

Therapy—In the above named condition when iron or other tonics are used for their general influence, this remedy should be given for its specific effect. Its direct influence upon the pelvic organs is sometimes magical under such circumstances.

It acts promptly upon **prolapsus** or retro or ante-version with relaxed and enfeebled tissues. In emaciated and enfeebled women the influence of this remedy is markedly conspicuous. It improves the function of the ovaries, overcoming **sterility** and correcting habitual **abortion** promptly. In the extreme nausea of pregnancy with vomiting, dizziness, or fainting spells, this agent has a direct influence and may be relied upon.

It is not sufficiently well known, but is a constituent of many of the proprietary "mother's cordials" or "female restoratives" on the market. It acts exceedingly well with helonias, senecio aureus, viburnum, and caulophyllum or cimicifuga.

While given for its influence upon the reproductive organs, it tones the stomach, increases the appetite, improves the digestion and the appropriation of food, and thus directly promotes the elaboration of good blood.

CAULOPHYLLUM.

CAULOPHYLLUM THALICTROIDES.

Synonym—Blue Cohosh.

Part Employed—Rhizome and roots.

Natural Order—Berberidaciæ.

Locality—United States.

Botanical Origin—Blue cohosh is a glaucous perennial herb, stem two feet high, smooth, round, purple when young, simple,

divided into two parts, one with a large sessile, tritermately compound leaf at the summit, with obovate, three to five-toothed leaflets, and the other with a biternate leaf, and a racemose panicle of small yellowish-green flowers about twelve in number; stamens, six; petals, six; ovaries, bursting early, leaving two ovules, which develop into drupy-like seeds about the size of peas, on thick stalks; rhizome horizontal, somewhat matted, four inches long, one-fourth inch thick; knotty from stem scars on the upper side, with numerous slender radicles, from two to seven inches long; externally, grayish-brown; internally, white, tough, woody, with a pith running longitudinally; roots many, matted, tough, wiry, inodorous; taste sweet, bitter, acrid. Solvents, alcohol, boiling water. Dose, ten to thirty grains.

CONSTITUENTS—Caulophyllin, leontin, two resins, gum, tannin.

PREPARATIONS—Caulophyllin. Dose, from one-fourth to one grain. *Extractum Caulophyllum Fluidum*, Fluid Extract of Caulophyllum. Dose, five to ten minims.

Specific Caulophyllum. Dose, from one to ten minims.

It is often necessary to continue this remedy, in whatever form given, over a considerable period of time in order to obtain its best results.

Physiological Action—From the end of the sixth month to the close of pregnancy is a period when many distressing symptoms are manifested, which may, in a measure, be relieved by Caulophyllum.

The growth of the foetus has been compared to an apple, which, when fully ripened, falls from the tree. The effect of Caulophyllum is to **prolong gestation** till the foetus is fully developed, labor being a physiological process at full term, and not pathological, therefore less protracted, less painful, and less liable to accidents.

Therapy—In **chronic uterine** disorders, in broken down constitutions with various reflex symptoms, the remedy is a specific. In the **amenorrhœa** of young women, at the commencement of the menstrual period, it may be given with confidence. In **painful menstruation** it has an established reputation.

Caulophyllum, although chiefly known as a remedy for the diseases peculiar to women, has been employed with advantage as a nerve sedative and to control congestion, in **bronchitis**, **pneumonitis** and **whooping cough**.

The various conditions in which the agent has been prescribed with benefit may be summed up as follows: Spasm, irritability, nervousness, insomnia, associated with atonic conditions of the female organs of generation; pregnancy with false pains of a spasmodic character; fullness and weight in the pelvic region, threatened abortion, moth patches in the face, feeble and insufficient labor pains from atony of the uterus, the pa-

tient weak and nervous; rigid os; after labor a protracted bloody lochia, with a tendency to hemorrhage from atony; after pains; amenorrhœa in young women; spasmodic dysmenorrhœa and painful menstruation, associated with chronic uterine disease; leucorrhœa from a relaxed condition of the vagina and uterus; aphthous ulcerations of the mouth in nursing women; dropsy associated with menstrual disorders; pain and discomfort during the last few weeks of pregnancy; dysmenorrhœa from imperfect development of the generative organs; hysteria, associated with chronic uterine disease; rheumatism of the joints of the hands, associated with pregnancy; irritation of the bladder from cystitis.

In **deficient labor pains**, *Caulophyllum* is generally a reliable remedy.

A sufficient dose of the remedy may be given every ten minutes, till the pains become regular and efficient.

POLYGONUM.

POLYGONUM PUNCTATUM.

Synonym—Smart-weed.

Part Employed—The whole plant.

Natural Order—Polygonaceæ.

Locality—United States.

Botanical Description—*Polygonum punctatum* is an annual plant with an intensely acrid taste, growing along roadsides, about brooks and water courses, and flowering in August and September; stem smooth, branched, decumbent or erect, slender, jointed, swelling above the joints, greenish-brown, with many glandular dots, one to two feet high; leaves alternate, lanceolate, petiolate, pellucid-punctate, wavy and scabrous on the margin, two or three inches long, about one-fourth inch wide; flowers small, greenish-white or purple, in slender, loose racemes; calyx four to five-cleft, covered with glandular dots; stamens six to eight; styles two or three, united half way up; fruit lenticular, opaque, rough; seed one.

The whole plant should be tinctured while fresh, as age renders it inert. Heat impairs its virtues; taste acrid, biting, pungent. Solvents, alcohol, water. Dose, from one to four drams.

CONSTITUENTS—Not analyzed.

PREPARATIONS—Specific Polygonum. Dose, from one to sixty minims.

Therapy—In **suppression** of the **menses** from cold, thirty drops in hot water may be drunk every two hours. It is a prompt remedy. It may be begun two weeks before the menses should next appear, if one period has passed, and given every four hours in cold water, until a day or two before the expected

time, when it can again be given in hot water. It acts well, also, when there is general plethora.

It acts promptly upon the skin and kidneys and seems to be to a certain extent antispasmodic, as in **hystero epilepsy**, or epilepsy depending upon suppression of the menses, it relieves the paroxysms and reduces the number of attacks.

Goss recommended it when there was **urinary suppression** from cold and in retention with lack of power in the bladder.

In certain forms of **flatulent colic**, when the pains are sharp and lancinating, with intermittent, severe griping, it is curative.

LEONURUS.

LEONURUS CARDIACA.

Synonyms—Motherwort.

Part Employed—The whole plant.

Natural Order—Labiatae.

Locality—Northern Asia, Europe, North America.

Botanical Description—Motherwort is a perennial herb, growing in waste places and flowering from May to September; stem quadrangular, three to four feet high, wand-like, rough, downy, channelled, purplish; leaves palmately five to seven-lobed at the base, acutely three-lobed above, opposite, rough, petioled, dark green, downy, arranged in four vertical rows; flowers in axillary cymes; calyx with awl-shaped, rigid teeth; corolla purplish, upper lip bearded, lower lip three-lobed, middle lobe obcordate; stamens, four; anthers in pairs; achnium, oblong, apex prolonged into a slender beak, bearing a white, bristly pappus; root composed of long, yellowish fibres; odor, aromatic; taste, aromatic, bitter. Solvents, alcohol, water. Dose, one to two drams.

CONSTITUENTS—Bitter principle, volatile oil.

PREPARATIONS—Extractum Leonuri Fluidum, Fluid Extract of Leonurus. Dose, from a half to two drams.

Specific Symptomatology—This agent is positive in **suppressed lochia** from any cause, **amenorrhœa from cold**; **dysmenorrhœa**, with morbid nervous excitability, and **hysteria**.

Prof. John King regarded motherwort as superior to all other remedies in suppression of the lochia, giving it internally and applying a fomentation of the herb over the lower abdominal region. The author has used it with excellent results.

Therapy—It is prescribed in the above conditions, also in delirium tremens, typhoid state in fevers, chronic diseases with wakefulness, restlessness, disturbed sleep, spinal irritation, neuralgia of the stomach and head, feeble digestion, general debility, chorea, convulsions, nervousness from irregular menstruation, palpitation of the heart, associated with

uterine disease, amenorrhœa, with chlorosis, cachexia and an irritable, excitable, enfeebled state of the nervous system, spasms and harassing bearing down pains, and morbid sensibility from uterine disease, pain in the pelvic and lumbar regions in females.

Motherwort is tonic and laxative, a diaphoretic somewhat like asclepias, an emmenagogue like cimicifuga and a nervine like scutellaria.

GOSSYPIUM.

GOSSYPIUM HERBACEUM.

Synonym—Cotton.

Part Employed—The bark of the root.

Natural Order—Malvaceæ.

Locality—Asia, Africa, United States.

Botanical Description—*Gossypium herbaceum* is a biennial or triennial shrubby plant, or small tree; five to ten feet high; stem round, pubescent, branching; leaves palmate, hairy, lanceolate, three to five-lobed; flowers yellow, large, two to three inches long and of about the same width, with purple spot near the claw, axillary, three-leaved involucre, calyx cup-shaped; petals five, stamens numerous; capsule three to five celled, one and a half to two inches wide, opening when ripe and revealing a white tuft of long, slender hair that surrounds each of the numerous seeds; root fusiform, giving off small radicals. Cotton-root bark of commerce is in thin flexible bands or quilled pieces; outer surface brownish-yellow, with slight, longitudinal ridges or meshes, small, black, circular dots, or short transverse lines, and dull, brownish-orange patches; inner surface whitish, of a silky lustre, finely striate; bast-fibres long, tough and separable into papery layers; inodorous; taste slightly acrid, and finally astringent (U. S.). Solvents, dilute alcohol, boiling water. Dose, from one-fourth to one dram.

CONSTITUENTS—An acrid resin, glucose, starch, fixed oil, tannin.

PREPARATIONS—*Extractum Gossypii Radicis Fluidum*. Fluid Extract of Cotton-root Bark. Dose, from one-half to one dram. *Specific Gossypium*. Dose, from five to twenty minims. Purified cotton (Surgeon's cotton), collodion.

Therapy—*Gossypium* is used as an **emmenagogue** and **parturient**.

It had a wide reputation among the slave women of the South as an abortifacient. It was used by them in the form of a strong infusion of the green root and is of value in suppression of the menses from whatever cause. It produces firm, regular and strong uterine contractions, much resembling *us-tilago maydis* and *cimicifuga* in its action. It may be used in

uterine inertia to increase the natural expulsive power of the womb and prevent the dangers of post-partum hemorrhage. It is a **hæmostatic** of some power being used principally to control the hemorrhage of **uterine fibroids** and **incipient cancer**. It is a valuable agent for metorrhagia and menorrhagia, but is not in general use, as the uterine tonics and stimulants in common use accomplish these results in their wider beneficial influence.

TIGER LILY.

LILIUM TIGRINUM.

Part Employed—The flowers and leaves.

Natural Order—Liliaceæ.

Locality—China. Cultivated in other countries.

Botanical Description—The tiger lily is a tall, cultivated plant, indigenous to China; stem four to five feet high; cottony; leaves, lanceolate, scattered, sessile, five-veined, the axils of the upper ones bulbiferous; flowers, paniced, four inches long, numerous, forming a pyramid of orange-red or purple blossoms, with black spots and revolute segments.

PREPARATIONS—Specific Tiger Lily. Dose, from one to ten minims.

Physiological Action—In 1863 Dr. Jeffries Wyman reported a case in which vomiting, purging, drowsiness, etc., were believed to have been produced in a little girl by the pollen of the tiger lily.

Specific Symptomatology—Neuralgic pain in the uterus, ovaries, and mammæ; acrid leucorrhœa excoriating to the labia, causing an eruption about the vulva and inflammation of the vagina; nausea from uterine disease or pregnancy; headache from uterine disease; nervous sick-headache; chronic inflammation of the uterus, with displacement; tedious recovery after child-birth; amenorrhœa, with burning pain in the ovaries; distress about the heart, with prolapse of the uterus; pain under the left breast; dysmenorrhœa; neuralgic pain in the uterus and ovaries extending down the inside of the thighs; a sense of weight and downward pressure in the lower abdomen; uterine displacements in general from debility.

Therapy—These symptoms of **uterine disease**, cured or relieved by tiger lily, show the action of the remedy within a limited sphere; but it is probable that it has a much wider range of action, as we find that the common white meadow lily was employed by the early settlers in this country as a general and local tonic in **prolapsus uteri**; and as a tonic in debilitated states of the female organs of generation, and in dropsy; while the root of the white pond lily was used as a local application to ulcers and inflammations. Prof. John King says:

"I recollect a lady who, several years since, was pronounced by several physicians to have **uterine cancer**, and which resisted all their treatment; she was permanently cured by a squaw, who gave her to drink freely of the decoction of a root, as well as to inject it in the vagina, which proved to be that of the white pond lily—**Nuphar Alba**."

Guided by the influence of these agents on the symptoms of disease, and by the diseases cured or relieved by them, we conclude that their action is similar.

Dr. Baldwin, of Michigan, uses the fluid extract of **Nuphar Lutea** in the local treatment of chronic uterine disease of whatever character or however severe, with the most gratifying results. His experience has extended over several years. The preparation is applied in full strength with cotton or on a tampon.

CYPRIPEDIUM.

CYPRIPEDIUM PUBESCENS.

Synonym—Yellow Ladies' Slipper.

Part Employed—The rhizome and roots.

Natural Order—Orchidaceæ.

Locality—North America.

Botanical Description—*Cypripedium pubescens* is a perennial herb with several round, pubescent, leafy stems from one to two feet high, flowering in May and June; leaves pubescent, three to six inches long, two to three broad, many-nerved, plaited sheathing at the base, oblong-lanceolate, entire, acuminate, alternate, generally the same number on each side; flowers large, showy, yellow, solitary, terminal, with four segments, shaped like an Indian moccasin, lip one to two inches long; rhizome horizontal, bent, four inches long, one-eighth inch thick, upper side beset with numerous cup-shaped scars, under side covered with simple wiry roots, four to ten inches long, brittle, dark-brown; fracture short, white; odor heavy; taste sweet, bitter, pungent. Solvents, boiling water, dilute alcohol. Dose, from five to fifteen grains.

CONSTITUENTS—Volatile oil, volatile acid, two resins, starch, fixed oil, sugar.

PREPARATIONS—*Extractum Cypripedii* Fluidum, Fluid Extract of *Cypripedium*. Dose, from ten to thirty minims.

Oleo-resin of *Cypripedium*. Dose, from one to three grains.

Specific *Cypripedium*. Dose, from five to sixty minims.

Administration—It must be given in rather large doses. A preparation of the fresh root should be employed, as it loses its properties by drying.

The best results have been reported when doses of fifteen

grains of the powdered root have been given, but from one to four grains every three or four hours is usually sufficient to relieve the nervous symptoms of typhoid fever.

Therapy—Cypripedium exercises a special influence upon **nervous conditions** induced by or depending upon disorders of the **female genito-urinary organs, -hysteria, melancholia**, restlessness with morbid excitability, sleeplessness, and pain from **general hyperæsthesia** induced by uterine or ovarian disorder will be benefited by this remedy. It will also relieve mental depression from spermatorrhœa and venereal excesses, acting somewhat like pulsatilla.

With children it allays **cerebral hyperæmia** from teething, irritation of the brain in scrofulous children, with nervousness and sleeplessness, and irritation in cases in which the mental faculties are prematurely developed.

It may be used in morbid vigilance, and jactitation in **typhoid fever, typhomania** and great sinking of the vital powers in adynamic fevers, also where there is morbid depression from chronic dyspepsia.

Cypripedium stimulates the nervous system in a moderate degree, and is suitable for cases where nervousness is the chief feature. It will relieve pain where restlessness and nervousness are associated with headache or neuralgia. Under its influence these patients become cheerful, and the nervous agitation disappears.

The action of Cypripedium is feeble, and relieves only functional derangement.

In scrofulous children its action is only temporary, and the syrup of calcium phosphate, with Fowler's solution, and cod-liver oil must be added to the treatment to overcome the constitutional tendency to the development of tubercular disease.

The conditions in which this agent has been used may be summed up as follows: Nervousness, restlessness with constant change of position, irascibility, abnormal excitability, sleeplessness, nervous irritation from atony, neuralgia, delirium, nervousness of infants, hypochondriasis, morbid sensitiveness of the eyes, nervousness from long illness, abnormal irritability, nervousness from over-exertion of the mind, hysteria, delirium tremens, nervous headache, nervousness from gastro-intestinal irritation, irritation of the brain in young children with threatened convulsions.

ARALIA.**ARALIA RACEMOSA.**

Synonym—American Spikenard.

Part Employed—The root.

Natural Order—Araliaceæ.

Locality—United States.

Botanical Description—*Aralia racemosa* is a perennial plant growing in rich and rocky woodlands as far south as Georgia, flowering in July; stem three to four feet high, dark-green, herbaceous, with widely spreading branches; leaves ternately and quinately decompose; leaflets ovate-cordate, slightly downy, doubly serrate; flowers in numerous, small, racemed-panicled umbels from the axils of leaves or branches; rhizome oblique, four to six inches long, half as wide; nodes approximate; stem scars prominent, one inch in diameter, older ones deeply concave; rootlets numerous, twenty to thirty inches long, one inch thick near the rhizome; taste spicy, aromatic. Solvents, alcohol, water. Dose, from five to thirty grains.

CONSTITUENTS—Volatile oil, resin, sugar, pectin, starch.

PREPARATIONS—Specific Spikenard. Dose, from five to forty minims.

Specific Symptomatology—**Suppression of the menses** from cold. **Suppression** of the **lochia** with pain in the uterine region. **Chlorosis, dysmenorrhœa. Acrid leucorrhœa** with an offensive odor. Bearing down pain from prolapsus uteri. Indolent, irritable, fetid ulcers.

Therapy—The agent is also prescribed with advantage in **asthmatic breathing**, humid asthma, hay-fever, bronchitis, and laryngitis in the early stage, coughs and colds, earache and deafness.

Chronic pulmonary complaints phthisis, scrofulous enlargement of glands, chronic catarrh, pain in the stomach in gouty subjects, rheumatism, syphilis, cachectic conditions are benefited by this remedy, also irritation of the bladder and kidneys, with scanty urine.

Aralia racemosa is stimulant and diaphoretic with a special affinity for the respiratory organs. It may be given to produce perspiration in the early stages of coughs and colds and to asthmatic patients whose complaint is aggravated by catarrh from taking cold.

In chronic complaints of the **uric acid** or gouty diathesis, and in syphilis, it increases waste, removes morbid products from the system, and gives tone to all the organs.

As a local application in chronic ulcers and chronic skin diseases it is both stimulant and antiseptic.

In foul smelling and acrid leucorrhœa, used as an injection, it acts as a disinfectant and may be employed to advantage.

A preparation made from the fresh root should always be employed, to get the best results.

GROUP IX.

Agents Used in the Control of Hemorrhage. Haemostatics.

ERIGERON
CINNAMON.
CAPSELLA.

ALUM.
URTICA DIOICA.
ACHILLEA.

ERIGERON.

Synonym—Fleabane.

Part Employed—The whole herb.

Natural Order—Compositæ.

Locality—North America.

Botanical Description—*Erigeron canadense* is an annual herb growing in waste places in the northern and central portion of the United States, and flowering from June to September; stem erect, two to six feet high, bristly, hairy, furrowed, branching; leaves linear, edged with hairs, lower ones cut-lobed; flowers many, small, white, paniced; involucre cylindric, rays very minute and more numerous than the florets of the disk; pappus simple.

The herb should be gathered when in flower and carefully dried; odor feeble; taste bitter, slightly astringent, acrid. Solvents, alcohol, water. Dose, from five to twenty grains.

CONSTITUENTS—A bitter principle, tannin, volatile oil.

PREPARATIONS—Specific *Erigeron*. Dose, from five to thirty minims.

Oleum Erigeronitis, Oil of *Erigeron*. This oil, which is obtained by distillation, is a pale-yellow liquid, with a peculiar aromatic odor and a pungent aromatic taste. Soluble in an equal quantity of alcohol. Dose, from five to ten minims.

Specific Symptomatology—The agent is given in **post-partum hemorrhage**, abortion with alarming flow, **menorrhagia** with profuse flow of bright-red blood, **dysmenorrhœa** with **blood clots**, **bloody lochia** increased by movements, **epistaxis**, **hæmoptysis**, **hæmaturia**, **hæmatemesis**, bleeding from the socket of an extracted tooth, incipient phthisis with **bloody expectoration**, **local bleeding from wounds**, bleeding from ulceration of the coats of arteries, **hemorrhage from the bowels** in typhoid fever—in all passive hemorrhages where there is no fever or constitutional irritation.

Therapy—It is used also in diarrhœa and dysentery with discharges of bloody mucus after the bowels have been evacuated by a proper cathartic, blood-specked and profuse watery discharges of **cholera infantum**, **ecchymosis** from injury, **chronic gonorrhœa** with increased discharge of mucus, gleet, **leucorrhœa**, **chronic dysentery**, **chronic diarrhœa**, **uterine leucorrhœa**, catarrh of the bladder, painful micturition, the urine being acrid, inflaming the parts, **gravel**, **dysuria**.

The oil of Erigeron may be diluted and employed as a gargle in sore throat and tonsillitis, while it may be applied externally to the throat.

In chronic rheumatic inflammations of joints, and painful swellings, a liniment of oil of Erigeron may be used with advantage.

Its action in promptly controlling uterine hemorrhage shows that it is more than an astringent—that it contracts involuntary muscular fibre in the uterus; in like manner it acts on the muscular coats of the bowels, on the arteries and the capillary vessels, controlling hemorrhage and increased mucous discharges.

As an astringent it acts like turpentine, but it is much less irritating. It is chiefly composed of terpene, a hydrocarbon which constitutes pure oil of turpentine. In chronic phthisis and in chronic bronchitis with profuse secretion, it lessens the discharge, modifies the cough and gives tone to the respiratory mucous membrane.

An infusion, or dilution of the tincture in water, is effective as a local application in ophthalmia, after the acute stage, as an injection in gleet, chronic gonorrhœa and leucorrhœa, and locally in prolapsus uteri, prolapsus ani, and indolent ulcers. In all these cases the remedy should be given internally for its specific action.

In cystitis from calculous concretions in the bladder, it relieves the irritation, it also acts favorably in chronic nephritis and albuminuria, in chronic cystitis and in chronic urethritis.

In **flatulent colic** and in the tympanites of typhoid fever it should be given internally and by enema.

The volatile oil, the tincture, or the infusion may be employed; and the dose, to be efficient, need not be large.

CINNAMON.

CINNAMOMUM ZEYLANICUM.

Synonyms—Cinnamon bark, Ceylon cinnamon.

Part Employed—The inner bark of the shoots.

Natural Order—Lauraceæ.

Locality—Ceylon.

Botanical Description—There are about eight well marked varieties of the cinnamon tree found in the East and West

Indies, China, South America and other tropical countries. The cinnamon tree of Ceylon, which produces a bark having the strongest aroma, is an evergreen from fifteen to twenty-five feet high, having a rough bark, trunk a foot to a foot and a half in diameter; branches numerous, horizontal, declining; twigs somewhat quadrangular; leaves opposite, three to five-nerved, coriaceous, bright-green, glossy, glaucous beneath, six to nine inches long, two to three inches broad, ovate-oblong, obtusely pointed, entire; petioles short, channelled; flowers small, silky, white or hoary, in axillary and terminal panicles; fruit ovoid, fleshy, black, size of a small olive.

In collecting Ceylon cinnamon, the tree is turned down to form stools, from whence spring four or five shoots, which in about two years are mature, and about eight feet high and two inches thick; they are now cut off, the bark removed with a peeling-knife, and tied together into bundles; after twenty-four hours the corky layer is scraped off, and the bark thus prepared is dried for one day in the shade and afterwards in the sun; the small quills are then placed within the larger ones forming a bundle about forty inches long and weighing about thirty pounds. The officinal bark has the odor of cinnamon, light-yellow, thin, smooth, shining, fracture splintering, easily powdered; taste warm, pungent, aromatic. Solvent, alcohol. Dose, from five to thirty grains.

CONSTITUENTS—Volatile oil, tannin, sugar, mannit, starch, mucilage.

PREPARATIONS—*Tinctura cinnamomi*, tincture of cinnamon. Dose, from a half to two drams. Specific cinnamon. Dose, from ten to thirty minims.

Physiological Action—This agent has long been used as a carminative and local gastric stimulant. It has a mild influence which is grateful and soothing. It has been used to check **nausea** and **vomiting** and to relieve **flatulence**.

Its rare properties have been overlooked by the profession and it has been assigned to its exact position by the masses of the people. Midwives and old nurses have long given a strong infusion of cinnamon to control **post-partum hemorrhage**, and it has been advised in "**nosebleed**" and in flooding **during miscarriage** and in **menorrhagia**. It has been useful in domestic practice, also in **diarrhœa** and **dysentery**.

Therapy—Cinnamon, in the experience of the writer, is a hæmostatic of much power and is positively reliable in all passive hemorrhages. It is not advisable to combine it with the usual astringents, as ergot, geranium or epilobium, but it acts in perfect harmony with erigeron and to a certain extent with turpentine. German authorities claim that as soon as the menses or any **uterine hemorrhage** becomes excessive, and produce exhaustion or cause alarm, the decoction should be ad-

ministered freely. It works to a better advantage in hemorrhage due to atonic conditions of the non-gravid womb, or where there is muscular relaxation, or a general flaccid state of the womb after delivery.

It certainly restores tone to the uterine muscular structure and induces tonic contraction. It will also, Hale says, moderate hemorrhage not dependant on plethora, anæmia or organic uterine disease. In some cases, during labor, it promotes the normal labor pains and materially increases uterine contraction, and prevents post-partum hemorrhage.

The writer, for nearly twenty-five years has used an extemporaneous prescription, which is his first resort in passive hemorrhage, if the stomach is not seriously disordered. It is somewhat of an irritant to the stomach, especially if full doses be given for a protracted period.

It is made by combining a dram each of the oils of cinnamon and erigeron, and adding enough alcohol to make two ounces. Of this, from ten to thirty drops on sugar, or dropped at once on water, will control nearly every controllable passive hemorrhage. He has used it in all the uterine conditions named above, in extreme **pulmonary hemorrhage**—persistent hæmoptysis, in the gastric and intestinal hemorrhages of alcoholics. In all forms of hæmaturia, especially in renal tuberculosis and in habitual nasal hemorrhage, in many cases, a single dose accomplishes the object. As stated, it is not well combined with ergot, but works harmoniously with ergot or gallic acid, if given in alternation.

CAPSELLA.

CAPSELLA BURSA PASTORIS.

Synonym—Shepherd's Purse.

Part Employed—The plant.

Natural Order—Crucifera.

Location—Europe and United States.

Botanical Description—An annual plant; stem twelve inches high, erect; leaves arrow-shaped, borne in a thin cluster at the base of the stem, reclining on the ground, pinnatifid, three to six inches long; branches remote, simple; flowers numerous, small, white, borne in terminal racemes; fruit a wedge-shaped pod, divided by narrow partitions into two cells, containing oblong seeds.

CONSTITUENTS—Volatile oil, fixed oil, resin.

PREPARATIONS—Fluid Extract. Dose, from fifteen to sixty minims.

Tincture. Dose, from one to two drams.

Specific Capsella. Dose, from five to thirty drops.

Therapy—The agent has been noted for its influence in

hæmaturia and other mild forms of **passive hemorrhage**. It is of some benefit as a mild diuretic, soothing irritation of the renal or vesical organs. In cases of uncomplicated **chronic menorrhagia** it has accomplished permanent cures, especially if the discharge be persistent and devoid of much color. The agent is also useful where uric acid or insoluble phosphates or carbonates produce irritation of the urinary tract.

In the treatment of mild forms of **intestinal hemorrhage** or **gastric hemorrhage** from simple ulceration, the agent has been used with some benefit, also in **atonic dyspepsia**, **diarrhœa**, both acute and chronic, and in **dysentery** and **bleeding piles**.

Externally the bruised herb has been applied to bruised and strained parts, to **rheumatic joints**, and where there was **ecchymosis** or extravasations within or beneath the skin.

ALUMEN.

Synonyms—Aluminum and potassium sulphate, alum, sulphate of aluminum and potassium.

Alumen Exsiccatum.

Synonyms—Dried alum, burnt alum.

Aluminum and Ammonium Sulphate.

Synonym—Sulphate of aluminum and ammonium, ammonia alum.

Occurrence—Alum occurs in certain volcanic regions of the earth in a natural form. For commercial purposes it is manufactured from the aluminum sulphate, crystallized in the presence of potassium sulphate, both in solution. Or the potassium sulphate may be replaced by the ammonium sulphate.

Description—It occurs in the form of large, colorless crystals without odor, with a sweet, somewhat pungent and strongly styptic taste. When gradually heated it loses its water of crystallization and becomes an amorphous white powder, known as exsiccated or dried alum. It is acid in reaction, freely soluble in boiling water and in nine parts of cold water. It is soluble in warm glycerine, but is insoluble in alcohol.

Physiological Action—Alum is actively astringent. It coagulates the albumin in the tissues and in the blood produces local contraction of the capillaries, is somewhat escharotic, and produces induration of the skin and tissues. It at first excites and subsequently diminishes the salivary secretion and the secretions of the mucous surfaces of the mouth and stomach, diminishing the secretion of the gastric fluids, and precipitating pepsin. It produces constipation, from the sup-

pression of the intestinal secretion. In large doses it has irritant properties which are in excess of its astringent properties, and may produce nausea, vomiting, diarrhœa, and stomach and intestinal pains. The method of its action as an astringent is not well defined.

Therapy—By its local action it is used to control **passive hemorrhage**. The powdered alum is thrown into the nostrils, or applied to a tooth cavity, or to the open blood vessels in a bleeding wound. The solution has been introduced into the uterus to control **post-partum hemorrhage**, and solutions are in common use for the treatment of **passive uterine hemorrhage and leucorrhœa**.

In **catarrhal conditions** especially, if there was great relaxation of the mucous membranes, with thin and watery discharges; in **serous diarrhœa** and in **colliquative perspiration**, it was at one time very generally used. It has been used as an astringent wash whenever a mild and unirritating astringent is needed. A syrup of alum has long been in use in the treatment of **pseudo-membranous croup**.

Alum is of value in the treatment of **whooping cough**. It is especially applicable in cases where there is a free or excessive expectoration. The writer has used it for several years with marked success, usually giving it alternately with belladonna. One grain of alum is alternated every two hours with one-half minim of the tincture of belladonna. Each may be prescribed in the syrup of tolu or simple syrup, of which half a dram or a dram may be given with each dose. If this course is adopted early the disease will sometimes disappear within two weeks. Begun after the disease is thoroughly seated, it greatly modifies the paroxysms, reduces their number and shortens the course of the disorder.

URTICA.

URTICA DIOICA.

Synonym—Nettle.

Parts Employed—The leaves, seeds and root.

Natural Order—Urticaceæ.

Locality—Europe, Asia, North America.

Botanical Description—The common stinging nettle is a perennial, herbaceous plant, indigenous to Europe, but naturalized in this country, growing in waste places and flowering from June to September. Stem, four feet high, four angled, branched; leaves opposite, three or four inches long, ovate-lanceolate, serrate, beset with stings; flowers, monœcious, or dioecious, small, greenish, in axillary clustered spikes; calyx, four-sepaled; stamens four; stigma a serrate globular tuft; achenes flat, erect, straight, inclosed between the larger pair of sepals,

root branching, creeping, with many fibers and fleshy shoots; inodorous; taste astringent, bitter. Solvents, alcohol, boiling water. Dose, from ten to forty grains.

CONSTITUENTS—Formic acid, or a substance closely allied to it, volatile oil, gum, starch, albumen, sugar, salts.

PREPARATIONS—Specific *Urtica*. Dose, from one to ten minims. Fluid Extract *Urtica Dioica*. Dose, from one to twenty minims.

Physiological Action—The common nettle contains an acrid fluid, which is located in a minute vesicle situated at the base of each of the stiff hairs, and when the nettle is handled with bare hands these sharp spines penetrate the skin, and the poisonous juice is expressed, giving rise to burning, stinging pain and inflammation. This effect is so powerful in some species, for example the *Urtica gigans* of Australia, that it is said to have killed horses. An infusion of the common nettles in large doses, produces severe burning pain and formication of the skin, without fever, followed by a vesicular eruption, containing a bloody serum. A crystalline alkaloid has been found in it which acts powerfully on the vaso-motor system, causing centric paralysis and arrest of the heart in diastole. A large dose of the seeds will produce a lethargic sleep.

Specific Symptomatology—**Hemorrhage, hæmoptysis, menorrhagia, post-partum hemorrhage**, epistaxis, **hemorrhage** from the bowels, **hæmaturia**, chronic diarrhœa, chronic dysentery, **bleeding hemorrhoids**, summer complaint of children, protracted bowel complaints, pulmonary catarrh, leucorrhœa, enuresis, bronchitis with excessive secretion, diabetes, incipient phthisis, unhealthy ulcers, scurvy, bleeding gums, recent wounds and sprains, goitre, tertian and quartan ague, corpulence, warts, burns limited to the skin, worms, strangury, gravel, sudden suppressions of milk, suppressions of eruptions, urticaria nodosum, insufficient supply of milk in nursing women, mild vesicular erysipelas, erythema, chronic disease of the skin, ulcers of the mouth and throat, gangrenous and scorbutic ulcers.

Therapy—*Urtica* has been employed for the general purposes of an astringent, both internally and externally, in hemorrhages, **ill-conditioned ulcers**, and in chronic disease of the mucous membranes of the bronchi, bowels and urinary organs, and it is generally agreed to be an efficient remedy. It, however, appears to have a dynamic action, as in **post-partum hemorrhage, suppression of the milk in nursing women, retrocedent eruptions**, urticaria, jaundice, dropsy, ague and corpulency its influence in small doses is reliable.

The fresh leaves have been used as a powerful revulsive in lethargy, paralysis, intoxication, congestion of the brain, and hysterical insensibility.

From a half to one ounce of the expressed juice of the fresh plant has been given at intervals of a few hours without untoward results.

ACHILLEA.

ACHILLEA MILLEFOLIUM.

Synonym—Yarrow.

Part Employed—The whole plant.

Natural Order—Compositæ.

Locality—Europe, North America.

Botanical Description—Yarrow is a perennial herb, growing in pastures and along roadsides in Europe and North America, flowering from May to October; stems numerous, simple, hairy, branching only near the top, ten to twenty inches high; leaves lanceolate, bipinnatifid, glandular beneath, alternate, two to four inches long, radical leaves petiolate, stem leaves nearly sessile, hairy, dark green, with small oil glands on the under side; segments linear, spatulate, three to five cleft, finely mucronate, so finely and minutely divided that they are hidden from one another; flowers white or rose-colored, arranged in flat-topped, dense, compressed corymbs; involucre inbricated, oblong; torus flat, chaffy; ray-florets four to five, short, ligulate; disk-florets tubular; achenes flattened, oblong; odor chamomile-like; taste, bitter, astringent, aromatic. Solvents, alcohol, water. Dose, from a half to one dram.

CONSTITUENTS—Achillein, volatile oil, tannin, achilleic acid.

PREPARATIONS—Specific Achillea. Dose, from five to sixty minims.

Therapy—Yarrow is advised by Webster in **uterine hemorrhage**. It is a mild astringent, probably acting also as a tonic. It is useful in passive hemorrhage when not persistent in character.

It is a beneficial remedy in diseases of the mucous surfaces, relieving irritation and profuse secretion. It soothes **intestinal irritation** and overcomes mild forms of diarrhoea. It is of benefit in improving the **tone** of the **urinary apparatus**, relieving irritation, overcoming strangury and suppression of the urine.

It acts best in strong infusion and its use must be persisted in. In general relaxed conditions it is a cure for **leucorrhœa**, where there is a profuse discharge, or thick, heavy mucus from enfeebled mucous membranes.

GROUP X.

Agents Acting Upon Micro-Organisms and Parasites.

CHAPTER I.

IODOFORM.	CREOLIN.
ARISTOL.	THYMOL.
BORIC ACID.	POTASSIUM PERMANGANATE.
RESORCIN.	PEROXIDE OF HYDROGEN.
CARBOLIC ACID.	FORMALDEHYDE.
CREASOTE.	SULPHUR.
GUAIACOL.	SULPHUROUS ACID.
GUAIACOL CARBONATE.	ARSENITE OF COPPER.

SALICYLATE OF BISMUTH.

IODOFORM.

Formula— CHI_3 .

Synonyms—Triiodomethane, diiodomethyl iodide, formyl iodide.

Occurrence—In the methane molecule three atoms of iodine replace an equal number of hydrogen atoms. This substance is formed by heating together, iodine, alcohol and potassium bicarbonate, in a closed vessel.

Description—It occurs in the form of small lemon-yellow hexagonal crystals, having a peculiarly penetrating, persistent odor, somewhat resembling saffron, and a sweetish, unpleasant taste. It contains 96.7 per cent. of its weight of iodine. It sublimes, and is very slightly soluble in water, to which it freely imparts both its odor and taste; is soluble in alcohol, benzin, ether, chloroform and the fixed and volatile oils, and in the disulphide of carbon. It is not acted upon by acids and alkalies, and is best preserved in the dark in closely stopped bottles.

Physiological Action—In its application to open sores and wounds Iodoform is not likely to produce constitutional effects, and yet poisoning has occurred. The symptoms of such an occurrence are usually a feeling of great lassitude, nausea, vomiting and the perception of odors not present (olfactory hallucination). There are headache, insomnia, rapid pulse, and cerebral excitement. In one case where the writer had freely applied an Iodoform ointment on a large burned surface for several days there were trembling, cold sweat and a noisy, excitable, mirthful mania for several hours. There is apt to be urinary suppression, or hæmaturia. These symptoms

may be followed by coma and death. There is a marked difference in the susceptibility of different patients to its toxic influence. The aged are especially susceptible and children are less liable to be unpleasantly affected.

The influence of this agent upon disease germs is not great but it is actively antiseptic. In this it is unique. It is asserted that it does not prevent the growth and development of pathogenic germs in culture media; that it is not always sterile, but it is sometimes capable of conveying disease. Its beneficial influence is explained in the face of these facts by the assertion that it is decomposed in the presence of germ development, and the product of this decomposition, acting upon the ptomaines, which also resent the germ growth, renders them inert, innocuous. In this manner it is asserted to control or inhibit suppuration. In some cases it is necessary to render Iodoform sterile by washing it with a sterilizing solution.

Antidotes—The iodine must be brought into chemical relation with a substance with which it will form a less toxic, or more easily eliminated compound. This is accomplished by the free internal administration of the sodium bromide, or the sodium bicarbonate, with a solution of which, the wounds to which the iodoform has been applied, may be washed. The acetate of potassium or sodium, or acid drinks, will facilitate its removal. In extreme cases active and persistent stimulants must be used, diaphoretics and moist heat, and persistent heat over the kidneys. The transfusion of the normal salt solution is advised by Kocher.

Therapy—Iodoform, then, is not the remedy for poisoned or septic wounds. It is the poison here introduced that we have to contend with usually and not the ptomaine induced by the processes of the growth of a germ of disease.

It is of service in discharging wounds, open offensive ulcers and putrid sores. There is no agent of more general use as a surgical dressing than this. It is in constant use in the private and hospital practice of nearly all surgeons and is gaining in favor. In dry powder, in ointment and in gauzed dressing and in various other forms it is always at hand. It is not considered especially efficacious in promoting granulation, in fact it has been declared to retard this process, but it prevents the influence of disease germs upon the open surfaces most effectually.

It is useful in every form of surgical operation. Its great objectionable feature is its offensive and penetrating odor. The enumeration of all the conditions in which it is used would include all sores, ulcers, discharging surfaces, catarrhal mucous membranes, glandular enlargements and suppurations, fetid discharges from all orifices of the body and persistent ulcerations. There is no form of skin disease upon which it has not been used, with varying results.

It is exceedingly serviceable made into a vaginal suppository which contains five grains, for introduction immediately after labor and following antiseptic douches. In isolated cases where the physician must be his own nurse, and where the importance of douches is not appreciated, and orders for their use entirely disregarded, the patient can be persuaded to introduce a suppository into the vagina morning and night, especially if there be a denuded mucous surface or a slight laceration, or if there has been an operation for ulceration.

Suppositories of Iodoform may be introduced into the rectum in the treatment of **fissures, ulcers** or **hemorrhoids**, to an excellent advantage.

The use of Iodoform in **tubercular conditions** has followed naturally upon the development of the knowledge of its antagonistic influence toward tubercular bacilli. In Europe it has been injected into the lung structure through the chest walls in the form of a one per cent solution in sweet almond oil, but no one in this country has adopted so extreme a measure.

Its use with us is confined to tubercular caries of the joints, **tubercular deposits** in the **skin**, and **pus sacs** from the presence of tubercular deposits. The pus is evacuated under strict antiseptic precautions, and the cavity thoroughly irrigated with a mild carbolic acid or boric acid solution. A sterile emulsion is prepared of ten parts of Iodoform to ninety parts of sweet oil. From one to five drams of this emulsion, according to the size of the cavity, are injected and retained. This is repeated every two to five days. In cases where healing fails to occur after a reasonable time it often becomes necessary to reopen the cavity, thoroughly cleanse it, remove all diseased material and perhaps pack it with Iodoform gauze for a short time or continue the injections as seems indicated. In tubercular infiltrations and other deposits where pus has not formed, a small quantity of the emulsion is injected. It prevents the development of bacilli, assists in the removal of the retrograde waste and promotes the essential healing processes. The use of the emulsion in cold abscesses, especially those having numerous fistulous openings, will yield satisfactory results.

It is also advisable in the treatment of **gonorrhœa** or **gleet** incorporated in a soluble bougie and introduced into the urethra. A very small quantity of the Iodoform is sufficient in each bougie. Five grains is altogether too much and may prove irritating; from one-half to one grain is sufficient.

The objectionable odor of Iodoform is difficult to mask. The balsam of Peru, freshly ground coffee, aromatic oils, especially the oils of citronella, thyme or eucalyptol may be used.

Iodoform has been given internally as an active alterative, and as a stomach tonic and intestinal antiseptic. It is given in pill form usually combined with other stomachic tonics.

It has been lauded in the treatment of **phthisis pulmonalis** and at one time was quite generally used. It was received with favor especially where the hemorrhages were otherwise intractable. The hæmostatic properties of Iodoform are sometimes remarkable in these cases. It is used in chronic liver disorders and in scrofulous conditions.

In the treatment of **syphilis** its internal use has been abandoned as being of no special value over iodine and other less objectionable agents.

Its persistent odor and the recurrence of this upon the breath after taking, are almost unsurmountable objections to the internal use of this agent.

ARISTOL.

Synonym—Thymoliodide, **Annidalin**.

Occurrence—This compound is prepared by dissolving thymol in a solution of sodium hydrate which is then mixed with a solution of iodine in potassium iodide.

Description—An amorphous powder, reddish-brown in color, almost tasteless and having a slight odor of iodine; insoluble in water, and nearly so in alcohol, but freely soluble in ether, chloroform, petroleum, and fixed oils.

Therapy—In its therapeutic properties the agent is the analogue of iodoform, performing all of its good offices without odor and without danger. It has the disadvantage of being sold at too high a price at the present time for general use. It may be used in exactly the same conditions as iodoform. With lanolin it makes an excellent ointment. It is suggested that it increases the discharge of serum from wounds and is best used in dry sores and skin disorders and in wounds where there is not much moisture. It has been dusted into the eye in interstitial keratitis with good results.

The British Medical Journal reports some experiments made by Nadaud on the hypodermic injection of Aristol in the treatment of **tuberculosis**. It was used in emulsion in the same manner as iodoform is used, and this investigator was more than pleased with the results. He dissolved one part of Aristol in one hundred parts of the sterilized oil of sweet almonds and administered one part of this solution each day.

In twenty-three cases of pulmonary phthisis no other medication was used. Twelve were permanently benefited and six improved satisfactorily. Three were not benefited and two died during treatment of other conditions.

Nadaud draws the following conclusions: "Aristol given hypodermically is perfectly innocuous; it is in a large measure eliminated by the lungs; it acts as an antiseptic and as a modi-

fier of nutrition; it acts very quickly, the effects beginning to show themselves on the sixth or seventh day by diminution of cough and suppression of night sweats; after from twenty to twenty-five days of treatment it is generally found that the patient has gained weight; the injections are useful in first and second stages of pulmonary tuberculosis; when cavities exist and expectoration is purulent they have no effect, or a very slight one; the injections cause no inflammation of the skin at the seat of puncture nor are they followed by abscess, eschar, or induration; the pain is trifling."

ACIDUM BORICUM.

Synonyms—Boric Acid, Acidum Boracicum, Boracic Acid.

Occurrence—Boric acid occurs free in nature in certain localities, notably, in Tuscany. It is obtained in America from the decomposition of borax, which is found in enormous quantities, especially in the southwestern part of the United States. In many parts of the western United States, it is present to a certain extent, in all soils. Borax is dissolved and treated with hydrochloric acid. The sodium, potassium, or ammonium base is saturated with the chlorine and the hydroxyl radical unites with the boric oxide.

Description—The product is crystallized in the form of permanent, lustrous, white, scaly crystals, somewhat unctuous to the touch, of a bitter taste and odorless. It is soluble in twenty-five parts of cold water, in three parts of boiling water, in fifteen parts of alcohol, and in two parts of cold glycerine, freely soluble in hot glycerine, insoluble in ether. The acid properties are not intense, in fact, in some cases it is nearly neutral, or even acts as a basic substance.

Physiological Action—In excessive doses it depresses the spinal centers and has produced depression of the heart, with slow, feeble pulse, reaction of temperature and disturbed respiration, nausea, vomiting, hiccough, great mental depression, impaired mental action, dullness and ultimately, coma. There are cutaneous irritation and eruption with ecchymosis and oedema. It is eliminated through all the emunctories.

As an antiseptic application, the agent is not poisonous, enough will hardly be applied to produce serious results.

Its germ destroying properties are not considered great, and yet its influence is of such a character that it has come into general use as a dressing powder for **wounds**, and its cleanly, odorless, non-toxic and non-irritating character gives it great popularity as a dry dressing after **surgical operations** of whatever character.

Therapy—As a mouth wash in cases of **ulceration**, in **aphthous**

or **gangrenous stomatitis**, it is useful and acceptable to the patient. It has been successfully used in **diphtheria**, both as a gargle, and for its constitutional influences.

To a saturated solution of boric acid, a few grains of thymol or eucalyptol can be added and a most serviceable antiseptic for general external or internal use, may be improvised. Its odor and taste can both be made very pleasant as a mouth or throat wash, or as a spray in the nasal cavity. It may be so combined as to answer an excellent purpose as an intestinal antiseptic where such an agent is needed. Boric acid is freely applied to **erysipelas** with excellent results, it is applicable in the form of a wet dressing on gauze and is quickly soothing and healing.

In saturated solution it forms a serviceable wet dressing for infected **wounds** whilst evaporation is prevented by the application of oiled silk or rubber protective. It may be left on for twenty-four or forty-eight hours if necessary and the virulence of the infection with the inflammation quickly abates. Applied to **boils** or **carbuncles**, the same wet dressing is more effective than poultices.

It is excellent in its application to open **abscesses** that have been thoroughly cleansed from pus and put into an aseptic condition, the dry acid here freely powdered on the granulating surfaces quickly promotes the healing.

Bromidrosis of the feet or of the axilla or other local forms, is successfully treated with this solution. **Bromidrosis universalis** will yield to its use promptly, but thoroughly alterative treatment is usually needed in these cases.

In **cystitis**, its solution is used freely as an irrigating fluid, especially if the urine is ammoniacal, and it is acknowledged to be of much value and perfectly safe. It has a soothing and healing influence upon mucous surfaces which is most kindly. In cases of this nature it is also given internally in doses of from six to ten grains every three hours. It is applied freely to **ulcers** of the **womb** after thorough cleansing, and it quickly promotes healing.

A solution of boric acid to which a small quantity of morphine is added, sometimes is very prompt in its action on various forms of **pruritus** wherever existing.

It forms an excellent wash in the common forms of inflammation of the eyes and may be used freely and safely, as it is non-irritating. It is especially valuable in **ophthalmia neonatorum**. It is used in **conjunctivitis** and in **granular lids**. A solution of five grains to the ounce is of sufficient strength for the eyes.

Rister's ointment, very useful for rough and **abraded skin**, sunburn, tan and freckles, for chapped hands and **minor burns**, is made by combining a dram each of boric acid and white wax with two drams each of lanolin and oil of sweet almonds.

CREASOTUM.

Synonym—Creasote.

Occurrence—Creasote sustains a close relationship to carbolic acid. It is obtained from the distillation of wood tar. It is contained only in the heavier product of the distillation, an oily layer that sinks to the bottom of the receiver. This is treated with carbonate of sodium and redistilled. The product is treated with a solution of potassium hydrate and sulphuric acid and the precipitate is well washed and is again distilled.

Description—It is a colorless volatile liquid with the consistency and certain characteristics of a light oil. It has a greasy feel and leaves a greasy stain on paper. It has a penetrating, smoky, disagreeable odor and a caustic, acrid, burning taste; dissolves in 150 parts of water and is freely soluble in alcohol, ether, chloroform and the oils.

Physiological Action—In its physiological action, it closely resembles carbolic acid. It is powerfully antiseptic, and is eliminated through the lungs and bronchial mucous membrane as well as through the kidneys. This fact renders it of service as a stimulant to bronchial secretion and a sedative to bronchial irritation. It thoroughly disinfects the lung structure and destroys germs there, and allays irritability of the gastric mucous membrane as well.

Therapy—The agent has come into general use in the treatment of **phthisis**. A purified form is used, and administered in a variety of ways. It is taken in doses varying from one to three drops combined with wine, glycerine, syrup of acacia, and other syrups of various characters, and in pill form. It diminishes cough, expectoration, fever, night sweats and diarrhoea, has a soothing action on the stomach, checks fermentation, allays irritation and controls vomiting. It promotes the absorption of food and encourages nutrition. It is truly a valuable adjunct to the treatment and has stopped the progress of the disease in its incipency.

In purulent **pneumonitis** with formed cavities, it is a superior agent. The combination of beef peptinoids and creasote is a palatable and nutritious combination in this stage of the disease. Its antiseptic and stimulating influences are apparent from the first. In chronic **bronchitis** and **bronchorrhœa** it has a specific influence in correcting offensive expectoration.

Valentine gave creasote in a number of cases of **diabetes mellitus**. He began with the daily dose of four drops and increased it to ten. The sugar disappeared and did not return with a starch or saccharine diet. It has also been used in **Bright's disease** and in some cases its influence was believed to be beneficial. It is contra-indicated in large doses as the kidneys will become irritated by it.

RESORCIN.

Synonym—Resorcinol Metadioxybenzol.

Occurrence—Resorcin can be made from the vegetable resins of *asafoetida*, *guaiacum*, *ammoniacum* or *galbanum* by fusing. It is usually made, however, from benzine heated with sulphuric acid. The acid is neutralized with lime water, sodium carbonate added and the whole boiled. The residue is extracted with ether, which evaporated, leaves the Resorcin.

Description—It is a colorless crystalline body of a reddish tint, with a pungent, sweetish taste and a characteristic odor. The reddish tint deepens to a reddish-brown by age and exposure. It is soluble in water, alcohol and ether. Dose, from one to four grains.

Physiological Action—Resorcin is closely allied to carbolic acid and is used in many of the conditions in which the latter is indicated. In full doses it produces extreme perspiration, salivation, vertigo, fullness in the head and deafness, unconsciousness and convulsions. It has an antipyretic influence, quite marked, but too depressing.

Therapy—It is specifically an intestinal antiseptic. For this purpose it is used in **catarrhal gastritis** with **gastric ulcers**, with much satisfaction. Its use has been persisted in through the course of **typhoid fever** and in **typhoid** conditions accompanying **pneumonia** and other inflammatory fevers, also in fetid **bronchorrhœa**, and during the stage of pus formation in inflammatory fevers, and in **cholera infantum**. It has been used to good advantage in **whooping cough**, and should be of much service in **diphtheria**.

Externally it is used as other stimulating antiseptics in ulcers and abscesses, to irrigate pus cavities, in **otorrhœa**, **gonorrhœa**, **leucorrhœa**, **gangrene**, **boils**, **carbuncles**, **chilblains** and **frost bites**. In skin diseases, it is used in erysipelas, eczema, psoriasis, herpes, chancres, and in myoma and epithelioma.

ACIDUM CARBOLICUM.

Synonyms—Carbolic acid, phenol, phenic acid, phenylic acid, phenylic alcohol.

This substance in its chemical character is closely related to the alcohols. It is a typical phenol and was one of the early coal tar derivatives, having been discovered by Ringe in 1834.

Occurrence—It is obtained by distillation, from what is known as dead oil, the heavy oil of coal tar which distills over at from 325 to 375 deg. Fahr. The product of this distillation, known as crude carbolic acid, is purified by a complex process, finally re-distilled and crystallized.

Description—It forms in colorless or slightly reddish-tinted, long needle-shaped crystals. It has a not unpleasant aromatic odor, and when fully diluted, a sweet, pungent, burning taste, followed by numbness. It is deliquescent in the air, freely soluble in all common menstrua, including the fixed and volatile oils and in fifteen parts of water.

Physiological Action—Carbolic acid is deadly in its action on the lower forms of vegetable and animal life, destroying disease germs and opposing putrefaction and fermentation. It prevents saccharine fermentation but does not interfere with the conversion of starch into sugar.

Taken into the mouth or applied to the skin, it produces burning and irritation, followed by numbness, having marked local anæsthetic properties. If its application be prolonged, it destroys tissue and may produce sloughing. This, or gangrene may be the result if it be painted around a finger or toe, or if a small area be included in its application. It occludes the capillary circulation by its constringent influence, and local death results.

It is readily absorbed, even through the skin, and poisoning is common through absorption from a broken surface or open wound. Taken internally, it induces diminution, or suppression of urine, with pallor, nausea, vomiting, nervous trembling, contracted pupils, abnormal nerve sensations and suspended reflexes. There are often great nervous shock, coldness of the skin, feeble, shallow breathing, collapse and sudden death from paralysis of the respiration. The evidences of its having been taken by mouth are the white patches of the mucous membrane of the lips—tongue and mouth covered with white skin from its rapidly destructive influence.

Carbolic acid is astringent and stimulant in its local application. It stimulates and promotes granulation in indolent ulcers, coagulates albumen and to an extent controls passive local hemorrhages.

Antidotes—When poisoning has occurred from its ingestion, the most speedy and accessible chemical antidote for immediate administration is dilute vinegar, or acetic acid. The vinegar should be diluted so that it will not induce strangulation, and a large quantity should be drank freely at once.

Alkalies are in common use, such as solution of common soap or sulphate of magnesium or calcium. If the syrup of lime or lime water is at hand, either is indicated. The whites of eggs are a domestic remedy. The stomach should be washed out after the administration of the neutralizing agents, and if the patient survives, the magnesium or calcium sulphate should be continued several days to neutralize and antagonize the acid in the system.

Therapy—The agent is a great favorite in private practice in all surgical operations and for the complete disinfection of instruments. In hospital practice the bichloride of mercury has been until recently commonly used in preference, although more dangerous and absolutely inapplicable to instruments.

The application of a weak solution of carbolic acid is authorized in all forms of **wounds** or **sores** or **open surfaces**, and as a parasiticide to tinea in its various forms. It is also used in many varieties of **skin disease** and in **small-pox** to prevent the itching and pitting. In anticipation of the latter disease it is used internally as a prophylactic.

Its application in full strength is indicated in **carbuncle**, a single application sometimes destroying the malignancy. In cases of this disease and in **malignant** pustule it not only destroys the germ of the disease, and thus the malignancy, but it relieves the pain by its anæsthetic influence. It has been employed to retard the growth, to destroy the odor, and to relieve the pain of **cancers**.

In **fermentative dyspepsia** with bad breath and a bad taste in the mouth, carbolic acid internally in doses of from one-sixth to one-half of a grain, in syrup or emulsion or in pill form, serves a good purpose. It is useful in **dilated stomach** and is excellent in some cases of **obstinate vomiting**. As a general intestinal antiseptic it is rather too poisonous and too difficult of administration for common use, and it can be readily displaced by other non-toxic and not unpleasant remedies, having been used in all diseases where profound antiseptics was necessary. It has been volatilized and inhaled in **diphtheria**, **croup**, **bronchitis** or **pneumonitis** with purulent discharge, and in **whooping cough**.

A drop applied on cotton will allay the pain of an **aching tooth**.

GUAIACOL.

Synonym—Methyl Pyrocatechin.

Occurrence—Creasote is not an invariable body, but contains as an active constituent from sixty to eighty-five or ninety per cent of guaiacol. This substance has a definite chemical composition and may be obtained from creasote by distillation.

Description—It is a light-colored fluid, has an agreeable odor and not unpleasant taste and is well borne by the stomach. It is freely soluble in alcohol and dissolves in eighty-five parts of water. That which has been said of carbolic acid and creasote may well be said of this agent as far as its physiological influences and its therapeutic properties are concerned.

Therapy—It is preferable in the treatment of phthisis to creasote, acting in the same manner, but more promptly and satisfactorily. It is given in wines or glycerine or in pearls or capsules. Its vapor is added to hot water and inhaled in chronic bronchial and lung troubles.

It is useful also in **tubercular** conditions of the **skin** and **joints** and in **lupus**. Antipyretic properties are attributed to carbolic acid and creasote, but this agent possesses them to a marked degree. If applied to the skin in fevers, it slowly reduces the temperature. This has taken place suddenly but usually without great depression or prostration. The great disadvantage is that after a reduction so induced, the patient is apt to have a chill and the temperature then rises as high or higher than before. Stolzenberg says there is great sweating and profound prostration after its use. It is unreliable and in fact, dangerous, when used for this purpose.

It has also been given in **gastric** ulcer and in **typhus** and **typhoid fever** and in **cholera** with good results. It does not undergo decomposition in the intestinal canal nor in the blood, as its odor can be detected in that fluid and in all the fluids and tissues of the body after it has been taken for some time.

For its external influences it can be applied where carbolic acid is indicated, but for many reasons the latter drug is often preferable. It will replace carbolic acid to advantage where there are inflamed serous or mucous surfaces or glandular structures with foul ulcers or gangrene. In **purulent otorrhœa**, **malignant** sore throat or **gonorrhœal** discharges, **leucorrhœa** or **chronic metritis**, it is useful.

GUAIACOL CARBONATE.

Synonym—Carbonate of Guaiacol.

Occurrence—This crystalline body is formed by the union of the sodium salts of guaiacol with carbonylchloride.

Description—It is a white neutral powder nearly odorless and tasteless, insoluble in water, sparingly soluble in glycerine and ether, freely soluble in alcohol and chloroform. It is given in pill form or in capsules in doses of from five to ten grains.

Therapy—It has recently been brought into prominence by the theory that in certain complex combinations it may be made the active agent in the abortion of **typhoid fever**. There has been a great discussion of its action in recent periodical medical literature; but we find that the best results are no better, if as good as those obtained from our own usual methods, and have the enormous disadvantage of inducing greatly increased irritation by combination with intestinal irritants. Used alone

or in non-irritating combinations, the agent will prove to be a valuable intestinal antiseptic; but like all agents that depend upon decomposition in the intestinal canal to release its active constituents, it must be more or less unreliable.

It is used in **fermentative diarrhœas** and other intestinal conditions depending upon decomposition, but we much prefer to depend upon our safe vegetable intestinal antiseptics and depurants to produce the desired results.

CREOLIN.

Occurrence—This substance may be obtained from the by-product, in the manufacture of carbolic acid.

Description—It is a dark-brown alkaline liquid of syrupy consistency and of a mixed chemical character. It precipitates in water, but is soluble in alcohol, chloroform and ether.

Therapy—It is an active antiseptic, but does not produce irritation. It is used where carbolic acid and other phenols are indicated, and for its antiseptic and antifermentative influence. It is highly praised as a **gastric** and **intestinal** antiseptic. It may be given in doses of from one to four minims.

It is used externally in a two per cent solution and in an ointment. A creolin soap is also prepared.

THYMOL.

Synonyms—*Acidum thymicum*, thymic acid.

Occurrence—This agent is closely allied in its composition to carbolic acid. It is derived from the essential oils of *thymus vulgaris* or thyme, and from the *monarda punctata*, *carum ajowan*, and other of the natural orders of *labiatæ* and *umbelliferae*. The oils are distilled and the heavier portion collected and frozen. The thymol crystallizes out.

Description—The crystals are large, transparent and colorless, of hexagonal shape; soluble in alcohol, ether and chloroform and in oils and fats and in 1,200 parts of water. They have the odor of thyme and have a warm, pungent taste. When saturated with camphor, choral or menthol, a homogeneous liquid compound is formed.

Therapy—This substance is a pleasant, stimulating antiseptic, and, when too freely used, is an irritant of much power, but rather expensive for general surgical use. Flies are drawn to it by its odor, which is also an objection. It is also a local anæsthetic to both the mucous membranes and the skin, and is quite permanent in its effects.

It is used in all the conditions named for carbolic acid and

the other phenols. It is especially desirable in that it adds to the pleasantness of the odor and taste of antiseptic douches, washes and gargles.

It is applicable to **putrid** and **gangrenous sores** and as a stimulating antiseptic gargle in **diphtheria**.

It is the active constituent of a popular remedy for chronic **nasal catarrh**, which was advised ten years ago by an English physician, and afterwards much praised in this country. In combination with menthol, it is constantly used by rhinologists and laryngologists in the form of spray.

The internal use of thymol will destroy the *filaria sanguinis hominis*, the cause of **chyluria**, and is thus curative in that disease. This is especially true if it be given in conjunction or in alternation with gallic acid.

Sandwith (Lancet) claims that thymol is a most perfect destroyer of the **ankylostomum duodenale** and many accompanying parasites in the intestines. Sometimes it takes many doses of the drug to destroy the last remaining nematode. In extreme cases two doses of 30 grains each are given on an empty stomach, and in two hours a purge is given. Subsequent smaller doses may be given on two or three occasions. The treatment is usually effectual.

POTASSIUM PERMANGANATE.

Formula— KMnO_4 .

Occurrence—The permanganate of potassium is formed as a result of a chemical interaction that occurs when the manganese dioxide, potassium hydrate, and potassium chlorate are mixed thoroughly together and heated in a crucible to a red heat. This salt, which is the potassium manganate, is afterwards cooled and pulverized, dissolved in water and boiled. The fluid is decanted, saturated with carbonic acid and cooled.

Description—The salt crystallizes in the form of beautiful dark-purple prisms, almost opaque, having a metallic lustre and without odor. They have a sweetish but disagreeable and astringent taste. They are soluble in sixteen parts of cold water and in three parts of boiling water. It is an unstable substance and must be kept in dark-colored glass bottles, closely stopped. Because of the facility with which this substance parts with its oxygen, the salt is immediately decomposed by alcohol. It decomposes with violence in the presence of organic substances and must therefore be kept from contact with such bodies. It is one of the most powerful of all known oxidizing agents.

In all its solutions, the presence of even minute quantities of organic matter may be detected by its decomposition, consequently perfectly pure distilled water is required in all its solu-

tions. It changes from a deep violet or rose-red hue, to a dirty brown color when decomposed.

Therapy—This agent is a powerful antiseptic, this property being exercised by virtue of its ability to readily release its oxygen as stated. A solution of this salt in the strength of from ten to twenty grains to the pint of pure water is of excellent service in cleansing pus forming surfaces. It is valuable as an irrigating fluid in cleansing **pulmonary abscess** and in washing out the pleural sac after the evacuation of pus. Its influence is similar in all such cases to that of the peroxide of hydrogen, but it is more efficacious, although not usually as manageable.

In extreme cases of **cystitis**, this solution may be used as an irrigating fluid, but it is advisable to immediately follow the use of the solution with a douche of sterilized water.

The solution is applicable to unhealthy granulating surfaces, to **cold abscesses** and to slowly healing **open wounds**, especially if purulent in character. In all such cases and in any condition where there is a foul odor, its deodorizing properties serve an excellent purpose. In malignant **diphtheria** and putrid ulceration of the throat or mouth, it is useful, also where the gums are spongy, and decaying teeth produce a disagreeable odor. It forms an excellent wash in **chronic catarrh** with an unpleasant odor, and in **otitis media**.

It is applicable to **felons**, slowly healing **boils** and **carbuncles**, and **open cancerous surfaces** may be freely irrigated with a warm solution of the permanganate three or four times daily. It destroys the odor of cancer and delays the rapidity of its development. The solution is useful in the treatment of **cancer** of the **os uteri**. It is of much value in simple ulcerations of the cervix and in offensive forms of leucorrhœa. The application of the solution on cotton or other dressings is useless, as it is decomposed before it reaches the diseased surface.

Applied immediately to **poisoned wounds**, by its oxidizing power, it at once destroys the venom. If it be applied into the open wound and the solution be injected hypodermically into the tissues immediately around the wound, poisonous results may be averted. Its antidoting power in these cases is chemical, not physiological, consequently it is valueless if free absorption has taken place.

Administered in full doses after the taking of any organic poison, the alkaloids and organic acids, and phosphorus into the stomach, they are rendered innocuous.

In doses of one grain in pill form carefully prepared, it has been given with success in the treatment of **amenorrhœa** of an atonic character, usually administered after meals. It is undoubtedly successful in many stubborn cases, but it is questionable if it is as useful as the manganese dioxide, which is not so readily decomposed. If it were not for the facility with which

it parts with its oxygen in the fluids of the stomach, it would be of much service as an intestinal antiseptic, and valuable as an oxygen carrier to the blood.

AQUA HYDROGENI DIOXIDI.

Synonyms—Solution of Hydrogen Dioxide, Solution of Hydrogen Peroxide—Oxygenated Water, Peroxide of Hydrogen.

Occurrence—This preparation was discovered by Thenard in 1818. In its formation, there is added to each molecule of water an atom of oxygen forming a double oxide of hydrogen. It has been prepared in the nearly pure state, under which circumstances it is a colorless liquid with a specific gravity of 1.45, which gives out its oxygen freely at sixty degrees Fahr., and at a greater heat may explode, resolving itself in water and free oxygen gas.

The authorized process of the formation of this substance is the decomposition of phosphoric acid and the dioxide of barium, the phosphate of barium being precipitated. The dioxide is dissolved in the liquid. The solution in common use contains about sixteen volumes of oxygen; a preparation known as **hydrozone** contains twenty-seven volumes of oxygen. The official solution is colorless, odorless, has a slightly acid reaction and acid taste. It is comparatively permanent at a temperature below 140 degrees Fahr. It is essential that the solution be kept in a cool place, and in bottles not too tightly stoppered.

Physiological Action—This agent is a powerful oxidizant, especially when brought in contact with organic substances. It destroys disease germs rapidly, and when brought in contact with ulcerating surfaces, it causes albuminous coagulation, and forms a white coating, evolving gas rapidly.

Because of its oxidizing properties, it is an active deodorant, destroying all products of **decomposition or fermentation**. Brought into contact with **pus**, the oxygen gas is liberated rapidly, the character of the substance is destroyed, and the diseased area is converted into a normal granulating surface. Its influence is similar to that of the permanganate of potassium. The objection to its use within closed cavities is the free formation of gas, and distension from this formation. There can be no objection, provided there be a sufficient opening to allow the free escape of gas, and subsequent irrigation.

Therapy—The agent is desirable under proper circumstances in washing out **pus cavities** in the **lungs**, but the application of this substance must be followed by irrigation with sterilized water. In the treatment of diseases of the nose and throat, where the excessive **catarrhal discharge** is present, a wash of this substance is of much value. In the ulcerative forms, a spray, applied in the nostrils and throat morning and evening,

of one part of hydrozone to eight or ten parts of warm water, will be found serviceable. In the treatment of **hay fever** much benefit is experienced from the application of solutions of hydrozone of one-half the strength of the above, or the peroxide of hydrogen, one part in ten of water, will be beneficial.

In the treatment of **croup** and **diphtheria** we have few remedies of greater service than this. In diphtheria, where the membrane has formed rapidly upon the tonsils, or upon the throat, where the direct application of the peroxide is possible, the entire membrane may be removed at one sitting. The course adopted by the writer has been to fasten the patient's mouth open with a properly adjusted gag, then covering his own face with a towel, saturated with a mild carbolic acid solution, the eyes only exposed, he seats himself in front of the patient and applies the sixteen volume peroxide with a camel's hair brush, removing the exudate as rapidly as it is loosened, allowing the patient occasionally to wash the mouth and throat with warm sterilized water, or a mild carbolic acid solution. It is not always possible to persist in the single application, sufficiently long to produce this entire result. Under these circumstances it is advisable to give the patient persistently a diluted solution internally, and to use the same preparation as a gargle every one or two hours, according to the severity of the case. In infants, local applications are often impracticable.

In **laryngeal diphtheria** or **membranous croup**, it is almost impossible to apply the solution to the membrane with sufficient persistency to entirely destroy it. One of our physicians, however, in despair, after having performed the operation of tracheotomy upon his own child, passed a long-handled camel's hair brush through the incision, and persisted in the application of this remedy to the membrane, within the trachea above the incision until the membrane was entirely removed, and the patient's life was saved.

Inhalations of the spray of hydrozone, have been used in the treatment of **bronchitis**, **laryngitis**, **pharyngitis**, **whooping cough**, **consumption**, and other lung and throat disorders with varying success.

Formerly the agent was more generally used in the treatment of wounds, pus forming surfaces, and upon sores. Failures may be due to too great dependence upon this agent alone. It is desirable to cleanse the surface thoroughly with this agent, especially if there be a tendency to the formation of pus, and to then use some other application, either dry, moist, or in the form of an ointment, as seems best indicated. It is occasionally an irritant, inducing a condition that must be subsequently overcome. This may be due to the presence of an excess of the free acid, which it usually contains for purposes of preservation.

Internally from the one-fourth to the one-half of a teaspoonful of the hydrogen peroxide, diluted with one-half glass of water, may be given before meals, when there is an old standing **catarrhal gastritis**, with ulceration. It certainly promotes free secretion of acid, stimulates the digestion, allays pain and causes the healing of ulcerated conditions.

It is argued that the agent suffers decomposition before it reaches the intestinal canal. It certainly prevents fermentation, destroys disease germs within the intestinal canal, overcomes bad breath, and prevents the formation or accumulation of intestinal gases. Upon giving a few drops of the solution in the drinking water, to a patient suffering from **typhoid fever**, its influence is quickly observed, and if an occasional flushing of the lower bowel with hot water which contains ten per cent of this substance, be practiced, a more speedy cure will certainly result. It is the writer's practice to give this preparation freely in all diseases of children where there is a tendency to **fetid diarrhœa**, **bad breath**, or **tympanites**.

It has recently been observed that the agent has an immediately destructive influence upon the bacillus of **tetanus**. In the treatment of that disease the infected wound has been thoroughly washed with hydrogen peroxide with marked benefit.

Externally the agent is used in the treatment of eczema, psoriasis, lupus, psycosis, erysipelas and in the poisoning from rhus toxicodendron, and the bites of insects. It is also used for the removal of acne, freckles, moth patches, dandruff, and for the cure of chapped hands.

FORMALDEHYDE.

Formula— $(\text{CHO})\text{H}$.

Synonyms—Methylaldehyde, Formicaldehyde, Oxymethylene.

Occurrence—This substance, practically new in medicine, was originally formed by passing the vapor of methylic (wood) alcohol over coarsely powdered platinum heated to a red heat. Other processes have since been adopted, all of which depend upon a rearrangement, by heat, of the atoms in the molecular construction of the methyl hydrate.

Description—A forty per cent solution of Formaldehyde forms the substance commercially known as **formalin** or **formal**—Formaldehyde as used in medicine. It is a light-green, mobile, exceedingly volatile liquid, pungent, aromatic, with a slightly acid reaction from the presence of acetic and formic acids.

Physiological Action—This substance, whether produced in the atmosphere directly, or given off as a vapor from its solu-

tions in concentrated form, is an irritant to the entire respiratory tract, and to the eyes. It is a most active antiseptic or disinfectant and deodorant. Internally its influence has not been widely observed as yet, beyond that it is a profound gastrointestinal antiseptic, preventing fermentation, especially that of butyric and lactic acids. Lamps have been devised for the combustion of methylic alcohol in an incomplete manner, setting free Formaldehyde in the air for the disinfection of rooms, instruments, or whatever is essential for surgical, hygienic or sanitary purposes. Extravagant claims are made that it destroys the bacteria of tuberculosis, typhoid, diphtheria, etc., and other germs, even in dilute forms of the agent. Further experiments prove that the penetrating power of the vapor is not great, and that it is not actively destructive to animal life, even in the lowest forms, although the vapor in a room will drive out flies, mosquitoes, moths and gnats.

Therapy—The agent is used largely at present for disinfecting purposes. The solution in vessels in the sick chamber prevents the spread of infection, if sprinkled over the bedding and furniture in the room. In all infectious and contagious disorders it will be found of service. It may be applied to instruments freely, and surfaces to be operated upon are bathed with it. In the treatment of **diphtheria**, **membranous croup**, the **sore throat** of **scarlet fever**, and the **bronchial cough** of **measles**, it has been used. The vapor of Formaldehyde inhaled will be found of much service in **whooping cough**, the number of paroxysms of which, are lessened by it, and their severity greatly modified. It has been used with satisfactory results in the developing stages of **phthisis pulmonalis**, and in **tubercular disease** of the **joints** and the **skin**, especially those of an open or ulcerative character. Open **wounds** and **infected sores** are washed with it, and it is used for **vaginal** and **uterine** irrigation, and for the irrigation and disinfection of **abscess cavities**. If dressings wet with the solution be kept in contact with **carcinomatous** and other **malignant growths**, with open, foul-smelling surfaces, the odor is destroyed, pain is allayed, and the development is retarded. In the treatment of **gonorrhœa**, especially that of the female, it is most satisfactory in its action. A five per cent solution thoroughly applied into the folds of the vagina with a cotton swab will destroy the infection and promote rapid healing.

SULPHUR.

Symbol—S.

Description—Sulphur, in its commonest form, is a lemon-yellow solid; brittle, tasteless, odorless and crystallizable, insoluble in water but soluble in the di-sulphide of carbon. It exists in three allotropic modifications which include many

forms. The amorphous variety consists of the crude sulphur and the roll sulphur or brimstone and the precipitated or milk sulphur. The crystalline variety consists of the flowers of sulphur, and the last is the plastic form. Sulphur melts at 234 deg. and boils at 824 deg. Fahr. It readily sublimes, and is purified by sublimation.

Occurrence—The precipitated sulphur, the flowers of sulphur and sulphur lotum or washed sulphur, are the forms used in medicine.

The precipitated sulphur is prepared by boiling the sublimed flowers of sulphur with slacked lime and water. The lime is neutralized by hydrochloric acid forming the calcium chloride, which remains in solution and the sulphur is precipitated in the form of a fine, amorphous, insoluble, pale-yellow powder without odor or taste.

The flowers of sulphur are prepared by subliming sulphur, the vapor escaping in a cold chamber where it condenses in the form of minute crystals of a yellow color, and with the characteristic sulphur odor.

Physiological Action—Sulphur is an antiseptic, an active parasiticide, and internally it is laxative. It was supposed at one time to possess an alterative influence and was administered as a blood purifier. It acts by chemical change and such action is apt to be unreliable in the system. In full quantities it is slowly decomposed, and the odor of the sulphide will appear upon the breath. It is absorbed, as it appears in all of the excretions, and jewelry worn during its administration will become tarnished, its volatility conducing to this fact. Used for a protracted period it will impair the condition of the blood, causing anæmia and inducing muscular weakness. Its protracted use also induces eruptions and eczematous conditions of the skin.

It is a mild laxative, softening the fæces and rendering them easy of expulsion.

Therapy—Sulphur was at one time used in the treatment of **diphtheria** for the destruction of the virulence of the **bacilli**. A combination of sulphur one dram, sulphurous acid two drams, syrup and glycerine, of each one ounce, can be given, a teaspoonful every two hours. The consistency of this compound retains it in contact with the throat, and this contact destroys the germs, the exudate being readily thrown off. This combination, alternated every hour with from five to ten drops of the tincture of the chloride of iron, was among the first successful methods adopted for the cure of **diphtheria**.

Sulphur is in common use among homœopathic physicians and is considered a most reliable agent in a wide range of conditions. It is specific with them in scrofulous or specific indurations of the lymphatic glands, or catarrhal conditions of

the mucous linings, from similar causes, with ulcerations or thick, fetid mucous discharges.

Sulphur is used as a domestic remedy in some localities, as a gargle for all forms of **sore throat** and **sore mouth**, especially in **tonsillitis** and in **pharyngitis**. It is of no benefit to inflamed structures without exudate. It has been used in stomach disorders and is of service in the **dyspepsia** of scrofulous patients, with bad breath, bad taste in the mouth, and a sensation of fullness in the stomach after eating. As a **laxative** it is useful in cases where there is deficient intestinal secretion, the feces being persistently hard and impacted, or **scybalæ** being present. It is of much service in rectal ulcers, and in anal fissures, and in **hemorrhoids**. Tablets of cream of tartar and sulphur have long been in common use for the cure of habitual constipation, and for inactivity of the liver, with deficiency of the biliary secretions.

Sulphur for many years has been the sovereign remedy for **itch**. Sulphur and lard externally, and sulphur and molasses internally are among the memories of the remote past, in the mind of many an old physician. The agent has lost none of its virtues in the treatment of **scabies**. It surely destroys the **acarus scabiei**, if the patient has a thorough bath with vigorous rubbing before the application of the sulphur ointment. The rubbing removes the dead cuticle over the burrows in which the female hides to deposit her eggs, and immediate contact with sulphur destroys the parasite. The male does not burrow.

In many forms of **skin disease** sulphur is curative. Alternated with potassium nitrate in the following manner, it is the surest treatment for intractable cases of **acne**, in young women with disordered menses, and irritable nervous system, that the writer has ever used. A teaspoonful of precipitated sulphur and as much powdered nitrate of potassium are each stirred into a quart of water, in separate vessels. Twice daily the face is washed in sulphur or tar soap to thoroughly cleanse it; it is then washed with clean hot water and rubbed with a soft cloth and dried. The sulphur lotion is thoroughly applied in the morning, and the nitrate of potassium lotion in the evening after the preliminary cleansing, or vice versa. The lotions are not wiped off but allowed to evaporate. This method has completely cured cases for the writer where the extreme disfiguration had almost deranged the mind of the patient, after resisting all treatment for years. Sulphur ointments, however, are not satisfactory in acne. The fat of the ointment base clogs the ducts of the glands and aggravates the condition. Sulphur is curative to **eczema** if the condition is caused by the presence of a parasite, otherwise it is an irritant and must be avoided. It is used also in **comedo**, in **ecthyma**, in **sycosis**, in **psoriasis** and in **impetigo**.

In **sciatica** and in some other chronic, painful, local, neuralgic, rheumatic or **gouty conditions**, sulphur has been used to envelop the painful part. Local perspiration results, there is absorption of the agent and permanent relief often occurs in a short time.

In some cases of urinary disorder sulphur is used where there is decomposition of the urine from chronic catarrh of the bladder with incontinence and frequent urination.

It is advised in conditions of general blood impairment with paralysis, but must be given in conjunction with nerve stimulants and tonics.

ACIDUM SULPHUROSUM.

Formula— H_2SO_3 .

Synonym—Sulphurous Acid.

Occurrence—Sulphurous acid is prepared by dissolving about six and one-half per cent of the weight of sulphurous acid gas in ninety-three and one-half per cent of water.

Description—It produces a colorless liquid which has an astringent, slightly acid taste, and the odor of burning sulphur. It absorbs oxygen from the atmosphere, increasing its acid character by the formation of sulphuric acid.

Physiological Action—This agent is an antiseptic and germicide of much power. It arrests fermentation by destroying the ferments. It is also a deoxidizing and decolorizing agent.

Specific Symptomatology—The indications for sulphurous acid in low fevers are feebleness and prostration, a red, sleek, or narrow, dry and pointed tongue, showing extreme lack of tone in the stomach.

Therapy—The agent has been used with much success in the treatment of sporadic disease. Given internally, it destroys the germ of **diphtheria** and is destructive to **tubercular bacilli**. It may also be taken internally in the treatment of **aphthous ulcerations** of the mouth and throat. From two to five drops of the dilute acid may be given at a dose in syrup. It will serve an excellent purpose in **pneumonia**, where there is expectoration of purulent matter and in **bronchitis**, where there is an excessive fetid discharge.

In **dyspepsia** with fermentation where there is vomiting of a material resembling yeast; in intestinal dyspepsia with the development of much gas and fetid fecal discharges, this acid serves an excellent purpose, especially those in cases where there is a deficiency of acids in the system as evidenced by dark-colored mucous membranes and deficiency of secretions.

Sulphurous acid externally applied will cure **parasitic skin disease** even more promptly than sulphur. It will destroy the

acarus scabiei and is useful in **psora**, **trichosis**, parasitic diseases of the scalp, and **porrigo**.

It has been applied with excellent effect to ill-conditioned ulcers and to **gangrene**.

The application of this acid is made with good effect to **sore nipples**. Kept constantly applied for a short time it destroys the cause of the ulceration, and simple ointments or other applications will then complete the cure. Diluted with glycerine it has been applied to **erysipelas**, quickly relieving the burning and preventing the further spread of the disease.

Sulphurous acid applied to **bruises**, **chapped hands** and **chilblains** is speedily curative. Half of a dram of this acid in an ounce of equal parts of glycerine and rose water, is a pleasant and speedy cure for chapped conditions of the hands, face or lips.

SULPHUROUS ACID GAS.

SULPHUR DIOXIDE.

For disinfecting purposes in contagious and infectious diseases the burning of sulphur is in general use for fumigation. The product of the burning of this substance is the dioxide of sulphur, which is a dense, colorless gas twice as heavy as air, with a pungent, suffocating odor. Its influence upon lower animal life and disease germs is exceedingly destructive.

In the process of the fumigation of infected apartments, all furniture, pictures and articles of a character or color which will be injured by the acid vapor must be removed. The apartment should then be densely charged with the vapor, which is allowed to remain for from eight to twenty-four hours. The room is then opened and thoroughly ventilated.

A German authority a few years ago advised this method of purifying the atmosphere of a room in which a patient suffering from **whooping cough** slept. The influence of the vapor on the atmosphere was accredited with the cure of many cases of this stubborn malady, sometimes in a single night. The nightclothes of the patient with the bedclothes, were subject to the fumigation, and the air of the room thoroughly renovated before the patient retired. The writer has much confidence in this method of treatment for whooping cough.

Ringer advises immersing the body in a bath of this gas for half an hour, the head being free, where there is an extensive parasitic disease. If the clothes are so treated the disease is permanently cured by the complete destruction of the germ.

We have succeeded in a short time by the application of the dilute sulphurous or sulphuric acid, applying the latter acid sufficiently strong to produce an intense smarting, washing it off when it is no longer bearable. A single application will destroy the germ.

CUPRIC ARSENITE.

Synonym—Arsenite of copper.

Occurrence—This substance is known as Scheele's Green. It differs slightly from Paris green in that the latter contains one equivalent of the acetyl radical. It is a powerful poison and is used in medicine only in minute doses.

Administration—The agent is usually prepared in soluble tablets containing the 1-50 or the 1-100 of a grain. One or two of these are dissolved in half of a glass of water, and in acute cases, a teaspoonful of the solution is taken every five, ten, fifteen, or twenty minutes, according to the severity of the symptoms. As a tonic, one tablet may be taken every three or four hours.

Specific Symptomatology—Its specific indications are diarrhœa, with frequent voluminous discharges. With this there is often violent vomiting of a large quantity of watery substance, and sharp, cutting colicky pains. The stools are tinged with green and are usually of a stinking, nasty odor. In several years use of the remedy, we have never failed once with above indications. The author makes no attempt to explain the action of the remedy.

Therapy—It is thus indicated in **diarrhœa of childhood**, especially in **cholera infantum**; it is certainly a sovereign remedy when watery, greenish-colored, **fetid diarrhœa** is present.

Hale says in cholera infantum with spasmodic pains, with screams and cramps in the fingers and toes, it is a most reliable intestinal antiseptic, and the change in the odor of the discharges is quickly perceptible. An impression is often made upon the entire character of the disease in a few hours. This reaction on the part of the general system from the prostrating influence of the disease seems unusually prompt after using this remedy.

The agent is also recommended in **chorea** and in the **irregular** and intermittent **heart** accompanying such a condition. Anomalous disorders of the heart are specified as indicated by a heart that beats at one time irregular and very feeble, and at another time irregular, but very violent with no altered heart sounds. We have organic remedies, however, for these conditions whose action is more thoroughly understood.

It is a most excellent remedy in **typhoid fever** with the characteristic diarrhœa. Its active intestinal antiseptic influence is marked and other influences obtain that are very desirable. Alternated with the indicated fever remedy in the early stages of the disease, the condition is often greatly abridged.

BISMUTH SALICYLATE.

Synonym—Salicylate of bismuth.

Occurrence—This salt is formed by the action of the nitrate of bismuth in solution in glycerine, upon the sodium salicylate.

Description—It occurs as a soft, white powder, soluble in acids, but insoluble in water, alcohol, glycerine and ether.

Therapy—French and German physicians recommend this agent as a local antiseptic for external use, and as a most valuable intestinal antiseptic. It would seem to be indicated internally in much the same conditions as the subgallate. Wagner claims that it stimulates the action of the heart. If these facts are true, it should be valuable in the asthenic stage of typhoid fever and other conditions of this character. It will probably be found of service in the treatment of tibial ulcers in the forming stage, after having thoroughly cleansed them with an antiseptic wash.

CHAPTER II.
Agents Acting upon Intestinal Parasites—Anthelmintics.

SANTONICA.

SPIGELIA.

ASPIDIUM.

CONVOLVULUS.

MALLOTUS.

KOUSSO.

POMEGRANATE.

SANTONICA.
ARTEMISIA PAUCIFLORA.

Synonym—Levant wormseed.

Part Employed—The unexpanded flowers.

Natural Order—Compositæ.

Locality—Turkestan.

Botanical Description—*Artemisia pauciflora* is a small, semi-shrubby, perennial plant, with a knotty, oblique root stalk from which arise numerous erect flowering stems and leafy shoots; stems six to eight, one foot high, glabrous; leaves multipinnatifid, one inch long; both branches and flower stems are leafy, the latter very minute; flowers numerous, one-tenth inch long, one twenty-fifth inch wide, oblong-ovoid, smooth, glossy, grayish-green, with twelve to eighteen involucre scales, inclosing three to five rudimentary florets; odor strong, camphoraceous; taste bitter, aromatic.

Constituents—Santonin, volatile oil, gum, resin.

Preparations—**Santonin** is a crystalline neutral principle, derived from *Santonica*. It occurs in the form of shining, colorless, or slightly yellowish, flattened, prismatic crystals, odorless, and at first tasteless, but subsequently bitterish.

Nearly insoluble in cold water, soluble in 250 parts of boiling water, and in forty parts of alcohol. Slightly soluble in chloroform and ether.

Trochesi Santonine, Troches of Santonine. Dose, from one to six troches. Santonin. Dose, from one-fourth to two grains.

Physiological Action—Five grains of santonine given to a child caused pain in the stomach, convulsions, insensibility and death. Various phenomena are produced by even smaller doses, as everything appearing yellow or red throughout the field of vision; urine stained deep yellow; a punctiform rash or an eruption like that in measles; amaurosis, flushed face, hot head, twitching of the eyeballs, dilatation of the pupils, foaming at the mouth, clenching of the teeth, jerking of the arms, stertorous breathing. Two grains caused the death of a feeble child.

Generally, recovery takes place after these symptoms, but occasionally death follows.

Specific Symptomatology—The following indications point to the presence of lumbricoid worms in the alimentary canal, but they are seldom all present at the same time. There may be intense itching of the nose in children, the child rubbing or boring the nostrils, with bloated abdomen, restless sleep, crying out in affright, grinding of the teeth at night, groaning in sleep, complete loss of appetite, tongue deep red without coating, deficient saliva, nausea, vomiting, fetid breath, depraved, erratic appetite with longings, great thirst, aversion to food, abdomen enlarged and hard, diarrhoea with whitish, slimy stools, or bowels constipated followed by looseness, colicky pains in the bowels, vomiting and purging after meals, worms discharged with the stools, cramps in the bowels at night. itching at the anus, limbs wasted, face pale, skin sallow and unhealthy looking, constant urging to urinate, wetting the bed, urine whitish and cloudy, scalding, dry, hacking, constant cough, tickling in the larynx and trachea, convulsive movements of the hands and arms, sensitiveness to the touch over the whole body, twitching of the muscles, lividity of the face, arrested breath, severe choking sensations, convulsive contraction of the fingers, general convulsions with violent agitation of the limbs, chorea, haziness of sight, loss of consciousness, restlessness, not satisfied with anything, will not sleep, fever occurring daily, usually in the afternoon.

Therapy—With the proper treatment for indications suggesting other agents these symptoms may be removed by small doses of Santonine.

The symptoms caused by the **presence of worms** in the intestinal canal, are partly local from indigestion, and partly from reflex irritation; where we find colic with loose slimy

stools, it points to intestinal disorders, while convulsive movements are reflex symptoms, consequent to the intestinal disease.

Santonine influences these conditions by stimulating the great sympathetic and giving tone to the functions of digestion and nutrition.

Extending the symptomatology in adults, we have irritation, pain and scalding at the base of the bladder in chronic uterine disease, burning scalding tenderness, and unpleasant sensations in the urethra and bladder, dysuria, suppression of the urine, chronic nephritis, strangury, chronic cystitis, chronic catarrh of the bladder. In these conditions, Santonine is one of our most certain remedies.

It has been employed with advantage in **nervous failure of sight**, nervous vomiting and nervous diarrhœa; but it is doubtful whether it has ever improved the sight in amaurosis or catarract, as has been claimed.

Santonine causes yellow vision and yellow urine. Where worms are demonstrated to exist in the bowels, it is a common practice to give santonine with a cathartic of podophyllin, or follow it with castor oil. The agent is toxic, as stated, and should not be given in material doses for the special purpose of destroying worms, when the child is constipated or suffering from fever.

SPIGELIA.

SPIGELIA MARILANDICA.

Synonym—Maryland pink.

Part Employed—The rhizome and roots.

Natural Order—Loganiaceæ.

Locality—United States.

Botanical Description—*Spigelia Marilandica* is a herbaceous plant with a perennial root, indigenous to the United States, and found growing in Georgia and other southern states, flowering in June and July; stems several, erect, nearly smooth, round below, four-angled above, purplish, ten to twenty inches high; leaves sessile, opposite, ovate-lanceolate, entire, acute, with the margin and veins roughly hairy, three to four inches long, an inch and a half to two inches and a half broad; flowers funnel-form, showy, two inches long, scarlet outside, yellow within, few in number, arranged on one side of the stem above the leaves; stamens short; anthers oblong; ovary superior, ovate; style about two inches long with a linear fringed stigma; fruit compressed, two-celled, two-seeded; seeds small, yellow; rhizome two to four inches long, one-eighth inch thick, horizontal, yellow-brown, with cup-shaped scars above, and many slender, crooked, light-colored rootlets below; internally whitish with dark pith; odor aromatic; taste

sweetish, pungent, bitter. Solvents, alcohol, water. Dose, from one to two drams.

CONSTITUENTS—Spigeline (bitter principle), fixed oil, volatile oil, resin, wax, tannin, salts.

PREPARATIONS—Extractum Spigeliæ Fluidum. Fluid Extract of Spigelia. Dose, from one-half to two drams.

Therapy—Spigelia is specific in the removal of **intestinal worms**. It need not be given in large doses, and if given with proper care is most effectual. An excellent formula is the following, which contains the united action of the two agents: Fluid extract of spigelia, two drams; santanine pulverized, fifteen grains; simple elixir, a sufficient quantity to make two ounces. A teaspoonful is given on rising and retiring.

If this agent is followed, on the third day, by an efficient non-irritating laxative, it seldom fails to remove **lumbricoids**. The worms are not always entire when removed, but the evidences of their presence are gone, a slimy or heavy mucous discharge occurring from the action of the physic.

Spigelia is said to have a mild influence upon the heart. Webster says it is beneficial in **endocarditis**, especially in the rheumatic form, and that it will protect the heart from rheumatic attacks. It is stated that it is beneficial in **angina**, in all **neuralgic heart affections**, and in **functional palpitations**. The **Spigelia Anthelmia** is thought to be more active in its influence upon the heart than the *Spigelia Marilandica*; otherwise there is but little difference in the two species.

ASPIDIUM.

ASPIDIUM FELIX-MAS.

Synonym—Male fern.

Part Employed—The rhizome.

Natural Order—Filices.

Locality—North America, Asia, Europe.

Botanical Description—The male fern and the marginal shield fern are both used in medicine, while most species of the genus are medicinally active.

Male fern is a herbaceous, perennial plant, with a large, scaly, tufted rhizome, from which spring a number of leaves disposed in a circle; fronds one to three feet high, lanceolate-ovate, acute, pinnate, bright green; leaflets remote below and run together towards the apex of the leaf; deeply lobed at the base, which gradually diminishes towards the apex; stipe and midrib beset with tough, brown, transparent scales; circular fruit dots on the veins near the midrib, covered by a circular indusium; rhizome horizontal, six to twelve inches long, two to three inches thick; in the dried form divested of its leaf-stalks and rootlets, compressed, tubercular, dark-brown, internally pale-green, spongy, with fibro-vascular bundles arranged in a circle,

with smaller ones outside, fragile, inodorous; taste sweet, becoming rancid, slightly astringent, bitter. Solvents, ether, alcohol. Dose, from one-half to two drams.

CONSTITUENTS—Felicic, felixolic, felosmylic, tomaspidic and pteritannic acids, volatile oil, wax, chlorophyll, gallic acid, albumen, pectin, starch, gum, sugar, salts.

PREPARATIONS—Oleoresina Aspidii, Oleoresin of Aspidium. Dose, from six to eight grains.

Therapy—A most active gastro-intestinal irritant, it is given to remove **tapeworm**. The oleoresin is given in doses of half a dram in capsules. One-half to one dram of the fluid extract may be given, or half an ounce of the leaves are steeped in half a pint of water and this is taken before breakfast. Oils should not be given after this agent, as they facilitate the absorption of its toxic principle which exercises a profound influence upon the nervous system. Saline laxatives or vegetable laxatives may be administered. The usual preparation of the patient is essential and it is necessary to follow the removal of the worm with mild tonics and restoratives. Unlike those often used, this agent does not produce unpleasant results, being in every way a safe remedy if taken in proper doses.

It does not impair the appetite or reduce the strength.

CONVOLVULUS.

CONVOLVULUS SCAMMONIA.

Synonym—Scammony.

Part Employed—The concrete juice of the root.

Natural Order—Convolvulaceæ.

Locality—Asia (Syria, Turkey, Greece).

Botanical Description—*Convolvulus scammonia* is a perennial, twining plant, a native of Syria and eastern Asia, flowering from July to September; stems annual, round, smooth, slender, numerous, rising from the crown of the root, fifteen to twenty feet long; leaves bright-green, smooth, sagittate, long petioled, alternate, triangular-cordate; flowers pale-yellow, funnel-shaped, on long, axillary, solitary, three-flowered peduncles; sepals five, ovate; corolla an inch long, spreading; stamens five; ovary, two-celled, four-seeded, fruit capsule ovate, half an inch long; root perpendicular, fusiform, fleshy, three to five feet long, one to four inches thick, smooth, yellowish, branched toward the lower end, containing acrid, milky juice.

Scammony is collected in June, the root being cut off obliquely near the crown and the juice collected in shells and evaporated by exposure to the air.

The scammony in commerce is in angular pieces or cakes, of a greenish or ash-gray color, a cheese-like odor and an acrid taste. It breaks with an angular, splintery fracture, having a

glossy, resinous lustre, and presenting small air cavities, when examined by a magnifying glass.

CONSTITUENTS—Resin (scammonin, identical with jalapin), gum, fibre, starch.

PREPARATIONS—Resina Scammoniae, Resin of Scammony. Dose, from three to eight grains.

Therapy—Scammony is a **vermifuge** and is useful in combination with other vermifuges to increase their action. It also acts as a cathartic for their removal, as its cathartic influence is of considerable importance. It is hydragogue and irritating in large doses and more or less depressing. It has a certain eliminative influence, and like podophyllum, has been given in conjunction with alteratives. It is greatly superseded in this line of action, by many other of our agents better known.

MALLOTUS.

MALLOTUS PHILIPPINENSIS.

Synonyms—Kamala, Kameela.

Part Employed—The glands and hairs of the capsules.

Natural Order—Euphorbiaceæ.

Locality—Philippine Islands, Abyssinia, India.

Botanical Description—The Kamala is a tree fifteen to thirty feet high, growing wild in the East India islands and other tropical countries, flowering from November to January; stem one foot thick, bark pale, young branches covered with red-grayish, matted, wooly hairs; leaves ovate, three to six inches long, petiolate, entire, acute; female flower in racemes, male in panicles of three together, both tomentose; fruit a roundish, three-celled capsule, about the size of a hazelnut, marked externally with three furrows, and thickly covered with a red powder. This red powder is the glands, and is collected by rubbing the fruit and sifting in baskets.

Kamala of commerce is a fine granular powder of a dark, brick-red color; and when recent, having a peculiar heavy odor, which diminishes with age; nearly tasteless. Solvents, alcohol, ether, alkaline solutions. Dose, from one to three drams.

CONSTITUENTS—Resin 80 per cent, citric, oxalic and tannin acids, rottlerin, malotoxin, paraoxybenzoic acid.

PREPARATIONS—Specific Kamala. Dose, from thirty to sixty minims.

Therapy—Kamala is an efficient remedy for **tapeworm**, ranking next to male fern. No preparation for its administration is necessary. To counteract griping it should be taken in cinnamon water or combined with hyoscyamus. If the first dose does not act, it should be repeated in four hours or followed with a dose of castor oil.

Kamala may be employed as an external application in herpetic ringworm, scabies and other skin diseases.

BRAYERA.**BRAYERA ANTHELMINTICA.****Synonym**—Kousso.**Part Employed**—The female inflorescence.**Natural Order**—Rosaceæ.**Locality**—Abyssinia.

Botanical Description—The *Brayera Anthelmintica*, named in honor of Dr. Brayer, who first made known its virtues in Europe, is a tree twenty feet high, with round, rusty, tomentose, villose, branches, flowering during October and November; leaves alternate, imparipinnate, ten to twelve inches long, opposite, serrate, lanceolate, villose at the margin, nerved beneath, flowers arranged in panicles about a foot long, much branched, corolla one-fourth inch broad, moncecious, staminate flower, greenish-yellow, pistillate flower purplish-red, with two roundish bracts and five obovate sepals, calyx top shaded and hairy; carpels, two or three; achene pointed by the remains of the style, containing a straight fleshy embryo with two plano-convex cotyledons.

The female inflorescence is that used in medicine, and is collected before the seed are ripened; odor tea-like; taste, disagreeable, bitter, acrid. Solvents, alcohol, water. Dose, from six drams.

CONSTITUENTS—Brayerin (a bitter, acrid resin), volatile oil, tannin.

PREPARATIONS—Extractum Kousso Fluidum, Fluid Extracts of Kousso. Dose, from one to six drams.

Therapy—Kousso is given for the removal of the tapeworm. An infusion of half an ounce in a pint of water should be made and drunk on rising in the morning. The patient should take but little food during the day, and if the bowels do not move freely, a physic should be taken at night. An extractive is obtained from the plant, known as Koosin, which is given in doses of twenty grains. The fluid extract in two dram doses is also given. The agent is said to possess abortive properties. All intestinal irritants should be given with care in pregnancy.

GRANATUM.**PUNICA GRANATUM.****Synonym**—Pomegranate.**Part Employed**—The bark of the stems and root.**Natural Order**—Granataceæ.**Locality**—Southern Asia and Europe; cultivated in the United States.

Botanical Description—The pomegranate tree is shrubby, small, not above twenty feet in height, with many branches; leaves entire, bright green, pointed at both ends; foot stalks short; large scarlet flowers; calyx red, fleshy; petals round, in-

serted at the top of the calyx; fruit the size of a small orange, somewhat flattened, orange-red or dark-yellow in color; seeds oblong, angular; bark in curved pieces three or four inches long, thin, odorless, with an astringent taste.

PREPARATIONS—**Pelletierine**, a colorless liquid, soluble in twenty parts of cold water, freely soluble in alcohol. Acted upon by sulphuric, hydrochloric, or hydrobromic acids, a crystalline salt is formed in each case. With tannic acid, the **tannate** of **pelletierine** is formed, a yellowish powder, odorless, pungent, astringent.

Dose of the alkaloid, from one-tenth to one-half grain. Dose of the salts of the alkaloid, from one to five grains. *Extractum Granatum Fluidum*. Fluid Extract of *Granatum*. Dose, from fifteen to thirty minims.

Physiological Action—Pomegranate has an astringent influence quite marked, at the same time in full doses it produces evacuation of the bowel, and in some cases irritation, and emesis may be induced. A decoction of the fresh bark of the root will produce the best results, when the anthelmintic influence of the agent is desired.

Therapy—It is a specific for the destruction of the **tapeworm**. Two ounces of the fresh bark is macerated in two pints of water for twenty-four hours, when it is then boiled down to one pint. After fasting one day, the patient may take a wine-glass of this every hour, until the pint is taken. It may induce vomiting and purging, but if the bowels do not move freely, a physic should be given near the end of the treatment, or sometimes a glycerine enema will be sufficient. If not at first successful, the treatment should be repeated within a few days. When the fresh bark cannot be obtained, the alkaloid or its salts may be resorted to. This agent has been used in **diarrhœa** and in **colliquative night sweats**. In **bronchorrhœa** and as a gargle in various forms of **sore throat**, it has produced good results. It has been used both internally and as a douche in **leucorrhœa**.

MEDICAL ELECTRICITY AND ELECTROTHERAPY.

Electricity is employed as a therapeutic agent in three forms, viz., **galvanic**, **faradic** and **static**, all governed by the same laws.

In order to employ electricity successfully, the operator must be well versed in its laws of action, its effects in health and disease, the pathology of disease, and the anatomical structure of the body. The chief obstacle to the use of this valuable agent in practice is not only the expense of an outfit, but the difficulty of acquiring a knowledge of the methods of its application.

The **galvanic current** is generated by chemical action. If a plate of zinc and a plate of copper be immersed in water acidulated with sulphuric acid, the zinc plate will be seen to dissolve by the action of the acid; and if these plates are connected by a copper wire, a galvanometer will detect a current of electricity in the wire.

The apparatus for generating galvanic electricity is called a cell or battery. In this simple form, however, much of the electricity is wasted because of resistance to its passage, the action is irregular and of uncertain strength, and various devices and improvements have been made in the original cell in order that these objections may be overcome. As there is some difference in the utility of the current generated by different cells, the practitioner should select the cell or cells, best adapted to his purpose in treatment. The Leclanche cell, which meets most of the requirements, consists of zinc and carbon elements with ammonium chloride as the exciting fluid.

In the galvanic current we find, as it were, two kinds of electricity, one of which we call positive and the other negative; the zinc of the cell being electro-positive.

If it be desirable to increase the current so as to overcome great resistance, the cells are connected in series, the carbon of each being connected with the zinc of the next; and where a large current is desired, with but slight resistance to overcome, the cells are connected, the carbons together, and all the zincs together. A battery of forty cells will supply a current sufficient for all medical and surgical work.

In order to control the amount of electricity used in a given case, a **rheostat** and a **switch** are necessary; the former, when

less than the current from one cell is required, and the latter, when a number of cells, less than the total, are desired in the circuit.

The principle of the rheostat is the resistance of an iron wire to the current compared with copper, and by putting the former into the circuit, the strength of the current can be reduced to zero, or regulated so as to give a fraction of the current from one cell. The switch enables the operator to bring any number of cells, or a particular cell, or cells into the circuit. Such a device is known as the universal current selector.

Another form of current regulator is the water rheostat which is constructed on the principle that when a metal plate in the circuit is immersed in water, the current is of maximum strength, and diminishes as the plate is lifted out of the water.

In order to measure the strength of any given current in the treatment of disease, a **galvanometer** or **milliamperemeter** is necessary. The galvanometer is constructed on the principle that a current in a wire will deflect a magnet near it to one at right angles with it, and the stronger the current the greater is the deflection.

The **dynamometer** is an instrument used to measure reversed, or alternating currents, as the breaking and the reversing of the current interfere with the action of the galvanometer. It is constructed on the principle that when two currents run parallel to each other and in the same direction, they attract each other.

For medical purposes the quantity of electricity is measured in milliampères, sometimes written, ma.

As instruments are so constructed that the resistance, which is taken as equal to 10,000 ohms, is allowed for, the indicator shows the exact strength of the current.

A **commutator** is an instrument for reversing the current.

A **rheotome**, or current breaker, depends upon the vibration of the armature of a small electro-magnet, the amplitude of the vibrations regulating the interruptions.

The mechanism for producing the **faradic**, or **induced galvanic current**, is much more complicated than the voltaic cell of a galvanic battery, and involves several fundamental laws of electricity in its construction.

When a magnet is brought near a closed circuit with a galvanometer to detect it, a current will be shown to be present, which is induced by the magnet. If several wires, as in a coil, are used, and instead of a magnet a galvanic current is employed, it will be found that a current will be induced also. This is the indirect or faradic current, and its electro-motor force may be increased, by increasing the coils in the wire; two turns of the wire giving twice as much force as one, and so with each additional turn of wire. This force is diminished by closing the circuit, and increased by opening or breaking it. By the

rapid passage of the lines of magnetic force across a conductor, there is produced an electro-motive force in the metal. On this principle the induction machine for producing the faradic current is made. It consists, in the main, of a wire coiled round a soft iron bar, and connected with a galvanic battery; and a smaller-wire coil round or enclosing the larger wire coil, but not connected with it. A lever is so arranged that by the action of a spring it serves to keep the circuit unbroken till the moment that the iron bar in the large-wire coil becomes a magnet by the action of the galvanic current and attracts a knob of soft iron fastened to the lever opposite to the iron bar, this movement of the lever breaking the circuit and demagnetizing the iron bar, when the same process is repeated. The small-wire coil obtains an induced current from the large-wire coil which carries the primary current. By making the soft iron bar within the large-wire coil to consist of soft iron plates, the electro-motor force of the induced current is increased 65 to 75 per cent, while by increasing the turns of wire in the small-wire coil, the induced current is made more mild and better suited for the treatment of certain phases of disease.

The fine-wire induction coil is now made with a very long wire, but with breaks in the wire, so that a longer or shorter-wire current can be employed.

In order to modify the strength of the current, the machines are so constructed that by means of a screw the soft-wire coil can be slipped on and off the large-wire coil, as it has been found that when the outer is drawn entirely over the other, the current is of full strength, which diminishes as it is moved off until it reaches zero when the coils are end to end.

The **sinusoidal current**, recently discovered, is an alternating current similar to the long wire faradic. The machine for generating it is like a small dynamo, and will give 50 to 100 and up to 1000 alternations per second. Those in ordinary use give 2000 alternations per second.

Formerly machines for generating **static electricity** were made on the principle that when a glass plate is rubbed with a piece of silk, electricity is generated; static induction machines subsequently followed, which had to be charged in order to start the current, and required a charger, now induction static machines are made which do not need to be charged.

The Holtz induction static machine, though not the latest kind, being the one most frequently employed in treating the cases reported in this chapter is described and for practical use is the favorite.

The simplest form of the Holtz static induction machine consists of two circular varnished plates, one fixed and the other revolving. The fixed plate has two openings, through which pointed strips of paper extend towards the revolving plate.

Opposite these paper strips and on the other side of the revolving plate are two metal combs connected with wires to the poles of the machine. When one of the paper strips is charged with positive electricity, and the poles are brought together, the charge is conveyed, by induction, to the comb opposite, which becomes negatively charged, the other comb becoming positively charged. From the sharp point of the first comb, negative electricity is discharged against the glass plate. This negative charge is carried round the plate to the second comb, and inductor, both of which discharge positive electricity on the plate. Part of the negative charge is neutralized, and the positive charge is carried round to the first paper inductor, which becomes more and more strongly electrified positively.

The receiver of the static machine must have no sharp edges or corners, or the electricity will readily pass off.

To increase the power of the current, the electricity from its prime conductor is allowed to pass through a Leyden jar, three sizes being supplied with some machines.

In using the machine, the negative current passes to the earth on one side, and the positive is collected by the machine on the other. In using the machine a brass ball, or electrode, is made to approach the prime conductor, till the current passes into the form of sparks, connection being made with a stool supported on glass legs (insulated), on which the patient is seated. When the machine is set in motion, sparks will pass from the prime conductor, unless the electrode is at too great a distance from it. When the electrode is quite near, the current is mild but increases in energy as the space is lengthened.

The **galvano-cautery** consists of an electrode connected by a copper wire with the cells of a galvanic battery of sufficient power, to which a platinum knife, or burner, can be attached, which may be a flattened loop of wire or other device for cutting or cauterizing. Platinum being a very poor conductor, becomes heated, while the copper wire does not. The battery is usually made with large plates, especially for the galvano-cautery, portable, with zinc-carbon elements, a solution of potassium bichromate in sulphuric acid being the exciting fluid.

The galvano-cautery is used to remove tumors from deep cavities, and wherever an operation with the knife would be difficult and dangerous because of hemorrhage.

The **electric lamp** consists of a glass flask from which the air has been exhausted, and within which is a loop of platinum wire, connected with a galvanic battery. When the current is turned on, the loop becomes luminous. This lamp is made so small that it can be used to light the throat and the closed cavities of the body for clinical purposes and operations.

When the discharge from an induction coil is passed through an exhausted tube, **X rays** are produced. The current from an

eight-plate, thirty-inch Holtz static induction machine will produce X-ray effects.

A Crooke's tube is now made especially adapted to this form of high potential current. It should be eleven to twelve inches between the terminals, the bulb about five inches long, and twelve and one-half inches in circumference. The machine can be made to run sufficiently fast with bicycle gearing. A machine with four to six plates, sixteen to twenty inches in diameter, may be used. A Windhurst charger may be used to charge old machines. All Holtz machines made prior to 1885 are available for X-ray use.

When a high potential static current is passed through a Crooke's tube in a darkened room, it becomes luminous; and if an opaque body like the hand is viewed by its aid, the bones become visible, or if the hand is held between the tube and a screen coated with platino-cyanide of barium (the *Fleuroscope*) a shadow of the bones will be cast upon the screen.

The galvanic current in a strength of twenty to one hundred ma. in a measure destroys nutrition with resulting atrophy, while in mild currents of one to eight milliampères they stimulate nutrition and cause normal increase of growth. The galvanic alternating current, mild, has about the same effect as the mild continued current. The negative pole should be applied to parts where there are recent **fibrous tissue** and exudate, the removal of which is desired. **Tumors** should be treated in the same manner. The positive pole is stimulant and may be used in neuralgia. The current does not pass through the tissues as one might pass a needle, but spreads out so that its effects are not limited to a line drawn through the core, as it were, of the current, but extend to all parts within the lines of force. The positive pole of the faradic battery is sedative, the negative stimulating.

In using **faradism**, it is best to employ a long fine-wire coil of high tension, tapped to various lengths. A coil of 7,900 feet, in five different lengths, is most convenient. A different physiological action is obtained, depending upon the length and thickness of the wire, and the number of turns of wire in the coil.

The faradic current may also be employed to relieve **pain**. In using the faradic current in the treatment of paralysis care must be taken not to cause spasm of the muscle by a too strong current. Rather a slow wave is desired, about thirty to the second, to exercise the muscle. In cases where one group of muscles is paralyzed and an opposing group draws on them unduly, it is well to apply the induced current pretty strong, and for a certain length of time, to fatigue the opposing muscle, and so give the paralyzed side a chance to contract.

Where a pronounced effect is needed, the static electricity is best, whether we want to restore reaction in nerve or muscle,

and where we want to impress the skin and its peripheral nerves, or produce a counter-irritant effect. It is locally a powerful stimulant in the form of the spark, and will bring to life functions which are lost and can be restored in no other way. It increases waste and improves nutrition. In the static machine, a tremendous electro-motor force is obtained on account of the great resistance offered to its exit, and when the patient is charged with this on the insulated stool, every organ and part is brought under its tonic influence.

The sinusoidal current gives all the desirable effects of the faradic current with practically no pain. A current of low frequency (50 to 60 per second) causes neither muscular pain, nor contraction, but nutrition is greatly stimulated, the consumption of oxygen increased fifty per cent, with a corresponding increase in the quantity of uric and carbonic acid excreted.

The electric current may be used in diagnosis when it is passed through a diseased organ, or pain will often be caused, which would not be the case in health. In the case of a paralyzed muscle, the contraction is likely to be slow and creeping, not the sudden jerk of a healthy muscle. By comparing the sensation or action of the healthy organ or part to the current with a weak and diseased one, we are often able to establish a correct diagnosis in doubtful cases.

In applying the galvanic and faradic currents, a great variety of electrodes with insulated handles is required to meet the demands of every case.

As the skin is a poor conductor, the current causes a burning sensation as the electrode is applied, which is obviated by wrapping it with absorbent cotton, wet with salty water, and also wetting the skin with the saline solution. The skin should be made aseptic in using these currents as absorption is increased by their action.

The burning sensation of the galvanic (positive) current and the stinging pain of the static spark may be increased, diminished or absent in disease. The cause may be central, hysterical or peripheral. It is diminished in sudden paralysis (shock) with loss of the sense of touch and the sensation of heat and cold.

Currents applied to nerves of special sense cause flashes of light, metallic taste, noise, dizziness, fainting, nausea, but in distinctive diseases of the cord, blood poisoning, and general torpor, these effects are diminished. In paralysis, spasm, hyperæsthesia, and anæsthesia we have a perverted action, or the muscles may be rigid or trembling. Electricity will relieve these conditions. In health, muscles contract according to the strength and frequency of the current with proportionate pain. In disease this may be morbidly depressed or exalted. When it is increased the lesion is usually central. The degree can be estimated by testing the sound limb.

When contractility is reduced, sensibility is usually lessened, or the sensibility may be absent while the muscle acts well. When both contractility and sensibility are diminished, the lesion is central (shock). Its extent may be judged by the time it has existed.

In paralysis the muscles are dilated, the limb blue and cold, the nails bluish-red, the hands dusky-pink. Here the mild galvanic current contracts the vessels and restores healthy circulation.

In sudden paralysis from a cerebral lesion, it is best not to resort to electricity for a time, as it may be from hemorrhage or embolism. When paralysis is followed by headache and dizziness, follow the same rule. When the paralysis comes on slowly, without pain, employ a gentle galvanic current, holding one electrode steady and moving the other over every part of the muscle.

The operator should try the current on his own hand first, with a current just strong enough to feebly move the muscles.

When contractility is diminished in a paralyzed limb, it is curable, but if normal it is not. Use the interrupted current and a large electrode, so as to reach every part of the muscle. If the arm, put one electrode on the deltoid and move the other over every part of the affected muscle; if the forearm, put one electrode behind the elbow, and move the other over the affected muscles; if the leg, put one electrode on the glutæus above and with the other stroke the affected muscles.

A few seconds is long enough to use the current; and it is of the utmost importance not to cause pain, which is less likely to occur if the electrodes are brought near together.

There are points where the nerve is superficial, and when the electrode is applied here, the action is better; and these points can be obtained from a chart, but a knowledge of anatomy is necessary as a way must be found through which the current will act most efficiently.

In this way contractility returns, with normal temperature, while the limb increases in size; at the same time, by reflex action, the condition of the brain and cord is improved.

In cerebral paralysis with late rigidity, as of the fingers, where they tend to dig into the flesh, faradize the extensors and flexors of the forearm. Even if the condition cannot be cured, it can be relieved in this way. Seance ten minutes.

In trembling and shaking from cerebral disease, charge with static electricity.

If there is partial or complete anæsthesia, it is probably from embolism or hemorrhage, and electricity is contraindicated.

In hysterical anæsthesia, use the static breeze to the parts so as to sting the skin; or draw off sparks.

In using the static current, be very careful not to let it pass through metal buttons, corset steels or metal ornaments about the patient's clothing, as it will cause pain.

In true spinal paralysis (Marshall Hall's) the cord is diseased or destroyed. In cerebral paralysis, the muscle is connected with the cord, but the latter is cut off from the brain. In true spinal paralysis, if there is no sign of electric irritability after four to six treatments, the prognosis is bad; if a little irritability is present it is good. In infantile paralysis, even after three or four years, where there is electric irritability, the galvanic alternated with the faradic, will do much good; and this is especially so if the case is taken early.

In paralysis where the bladder and rectum are affected, much good may be done by passing the faradic current through these organs.

When spinal paralysis advances slowly, use galvanism where the limb is wasted, faradism where it is not.

In paralysis from injury, electricity will remove the neuritis, and restore the weakened and wasted muscles.

In paralysis of the face (7th pain) stimulate the skin with the brush.

In paralysis from lead poisoning, use a powerful current once a day with ten cells if necessary, so as to affect the muscle, and have the electrode and skin well moistened with salt solution.

In anæmia of young girls, charge with the static current. Neuralgia, sciatica, migraine, tic douloureux, numbness, the sensation of "pins and needles," are often relieved and often cured by electricity.

In obstinate neuralgia, the static current has given the best results.

In like manner, other forms of disease yield to the electrical treatment. The list of cases reported as successfully treated, is a long one,—indigestion, sick headache, congestion of the liver, spinal irritation, general debility, neurasthenia, uterine displacements, stenosis, and induration, perimetritis, salpingitis, cellulitis, ovarian and fibroid tumors, enlarged glands, hysteria, ankylosis, œdema, and morbid states of the mind. So much is claimed for the remedy that one is struck with astonishment at the threshold of his inquiries, and is inclined to be skeptical, but the abundance and high character of the testimony leaves little or no doubt as to its truth. Recent improvements in the machines for generating and employing the agent have rendered it possible at this time to do what was formerly impossible. This is especially true of the latest improved Holtz static influence machine, which bids fair to make the current take the place of all others in the treatment of disease. The improved high-tension induction-coil (faradic) current is sedative. This too is a late improvement.

The fundamental idea upon which all the therapeutics of electricity are based is its nutritive power. It stimulates the peripheral nerves, and their end organs, which results in the improved nutrition of the patient. It is a common observation that local and general treatment with electricity alone increases the weight and improves the general health, even if the special disease is not cured. The muscular contraction by the local spark acts as massage of the tissues, while the general vibratory effect of a rapid alternating potential, subjects the constituent articles of the tissues to an insensible molecular massage, the benefits of which are apparent in the vaso-motor system, from the better circulation, increased exudation, better oxidation, better sleep, increased cheerfulness, and vital energy, and a general stimulation and improvement.

Various manifestations of mental depression, morbid mental states with threatened insanity have been cured by the static current. It is also efficient in chronic gout, rheumatism, dyspepsia, insomnia, neuralgia, writers' cramp, neurasthenia, functional aphonia (hysterical), and chorea.

The therapeutics of the static induced current are similar, in some respects, to those of the faradic current of high tension. It greatly augments nutritional changes, produces intense contractions and practically no pain.

Electricity is serviceable in a very large number of chronic cases, going to the root of the difficulty. It acts on protoplasm and on the trophic nerves which preside over nutrition.

Static electricity affects the deep parts of the body, the interior of large joints, the ovaries, deep seated muscle when diseased, and cures after the galvanic and faradic currents fail, showing a special action.

In all vaso-motor diseases, functional cerebro-spinal diseases or neuroses, there is nothing equal to static electricity as a remedy.

Static electricity makes a profound impression on nutrition, promotes constitutional vitality in the highest degree, stimulates the vital functions, promotes secretion and excretion, and increases resistance to disease and unhealthy surroundings.

Static electricity increases the pulse rate, stimulates glandular secretion, and promotes the insensible perspiration. It assists the vital force, increases the excretion of urea and lessens the amount of uric acid in the system by promoting oxidation. It increases the appetite and body weight when lost by disease. It lowers blood pressure and causes a gentle perspiration when general electrization with sparks to the spine is given. It slows the heat when too fast, and increases it when too slow and raises the subnormal temperature in neurotics.

There is a wave movement or perturbation of the static current that changes the molecular relation of the elements of the body, and in this way all its functions are improved.

The basis of static treatment is a general electrification of the patient by connecting him with the acting pole of the machine. He becomes a great electrode. The other pole is connected with the earth. As the machine is put in motion electricity passes on one side to the earth, and on the other to the insulated stool and permeates every part of his body and surrounds him with a cloud, as it were, of tremendous power.

Static electricity may be felt forty inches from the electrode, which is not the case with the galvanic or faradic currents.

When the system is below par we use the positive (static) pole; and when there is a hyper-excitable state of the nervous system the negative pole to the patient. The positive breeze (static) is best to relieve pain, as in neuralgia, headache, local inflammation, congestion, nervous headache, nervous insomnia, irritability, rheumatic pains, sciatica, lame back, cold extremities, ovarian pain, congestion of the liver, nausea, and dyspepsia.

The static spark will contract muscle and is a most energetic agent, having a wide-spread influence on the tissues. When the sliding poles are wide apart the spark is too strong, but as they are brought together it is made weaker. A current through a Leyden jar is apt to be too strong. The more rapid the revolution of the plates of a static machine the stronger the current. By moving the plates rapidly, and passing the current through a small Leyden jar a current is obtained about equal to the high tension coil (faradic) current; and by revolving the plates slowly we get a current similar to the slowly interrupted (faradic) current; while a medium Leyden jar gives a medium secondary induction coil current; and the large Leyden jar current is like the shortest coarse wire secondary coil current.—(Monell).

When the static current is applied with the positive pole it is an agreeable tonic, and is suitable treatment when the system is below par, as in neurasthenia; anæmia; after effects of la grippe; brain fag; physical or mental exhaustion; exhaustion from protracted disease, overwork, anxiety, excessive lactation, or suppuration; impaired nutrition; the effects of social dissipation; functional derangements or morbid mental states, as hysteria, melancholy, hypochondriasis, or nervous insomnia. It is equal to a sea voyage, or a change of climate.

The ball electrode may be passed over the body, but the long and strong spark is most effectual in stubborn cases. It must be used with discretion.

By approximating an interrupter to the conducting rod, the potential is suddenly reduced to zero. This alternation of the static current from zero to a high potential, and frequently repeating it, exerts a powerful stimulating and tonic effect, and brings back the color to pale cheeks and restores strength to the

debilitated patient like outdoor exercise. It is not necessary to remove the clothing in using static electricity.

With galvanic and faradic treatment the physician must observe a certain technique to secure particular nerve and muscle effects, but with the static current this is not necessary.

Ordinary Leyden jar currents and ordinary faradic currents do about the same therapeutic work, but the faradic from a fine wire coil apparatus will do what the Leyden jar currents fail to do. The rapid vibrator current of the fine wire induction coil, with the bipolar electrode, will exert a sedative effect on inflammatory tissues within the pelvis, not to be obtained by a rugged current like the static, which will relieve subinvolution when used with slow interruptions.

A static current from plates revolving 100 times per minute is best in the treatment of partially paralyzed muscles; revolving too fast (several hundred times per minute) it causes pain, but if very fast, and the spark-gap is reduced, a good massage effect is produced. Static electricity will relieve lesions of muscles from traumatism; allay local inflammation; remove sudden pain; quicken the reparative processes of nature; increase the mobility of stiffened muscles and joints; produce a superb form of passive motion and massage; excite recuperative contractions in paralyzed muscles from injury, or inaction from splints; tone up and strengthen the patient, and render with quick facility an immense amount of valuable aid.—(Monell).

In the local treatment of diseases of the generative organs of women the high tension induction current is indispensable, but static electricity will do good by raising the general tone, and will relieve many distressing symptoms.

The static spark is a regulator of menstruation, but cannot take the place of the high tension induction coil current, and the improved galvanic and faradic methods of Apostoli.

Every buyer of a static machine ought to be fully instructed in its management, as it is too valuable to be used otherwise.

To keep a static machine in order demands the same unremitting care as the soldier's rifle. It must be kept clean and free from dust, and be frequently polished. The doors of the case must be kept tightly closed, the poles separated, the groundings taken off when not in use. It must be kept free from damp; and to aid this a dish filled with dry chloride of lime must be kept in the case; and as it absorbs moisture it can be dried in the oven and used again.

Therapy.

The following cases are intended more particularly to show methods of treatment, as regards the use of currents, and are selected from a large list of cases cured, and are intended as typical ones, the time required in each case being stated.

Amenorrhœa. Negative pole in the uterus, positive clay electrode on the abdomen, galvanic current, 15 to 40 ma. Seance, 10 to 15 minutes, three times a week for three months.

Aphonia, hysterical. The static spark, or faradic current to the front of the neck usually relieves at once.

Abscess, threatened. Positive electrode, wrapped with wet cotton, directly to the lesion. Negative at some distance on the body. Galvanic current, 10 ma. Seance, 10 minutes.

Anæsthesia, local. Galvanism, positive pole: (a) Fine wire secondary faradic rapidly interrupted.

(b) Cataphoresis. Cocaine on positive galvanic pole.

Asthma. Strong faradic current applied to the opposite sides of the neck for 15 or 20 minutes.

Atrophy. Positive electrode over the sternum, negative *labile* over affected parts, 20 ma., for 10 minutes, every second day.

(a) Coarse wire secondary faradic, slow interruptions, same manner as above, 15 minutes daily.

Boils, to abort. Positive pole, covered with cotton, to lesion, negative pole at some distance on the body, 20 ma. Seance, 10 minutes daily.

Bronchitis, chronic. The cough, insomnia, expectoration, dyspnœa, rheumatic pains and debility of chronic bronchitis are cured by the static interrupted current of very high potential and small amperage.

Chorea. There is a tendency to recovery in most cases of chorea, but where the body is wasting, the mind apparently giving away, and the disease is proceeding unchecked, if not increasing, static electricity, if it will not cure, will effect a marvelous change.

Constipation, with concomitant symptoms. Galvanism. Negative pole to the spine, positive to the abdomen; kneading the abdomen with the sponge electrode; later, electro-roller, used in like manner. Seance, 20 minutes, three times a week. Change the current from time to time, using the alternating galvanic. Change the poles, negative to the sacrum, positive to the rectum, and so on, bringing the current to bear on all relaxed and feeble tissues, and continue treatment for three months. In obstinate cases use the galvanic in alternation with the faradic current, using both the fine and coarse wire faradic currents.

In this way the most obstinate cases of constipation which have for a long time resisted other treatment, have been cured,

together with concomitant symptoms and conditions, as prolapse of the rectum, hemorrhoids, neuralgia, headache, and, in women, long standing uterine complaints and obesity.

Debility. The debility of old age, and that following acute disease, are relieved by the static current.

A static machine of moderate price can be purchased by the patient, set up in his room, and treatment be carried on under the direction of the physician.

Electricity cures these cases by increasing the flow of bile, stimulating the intestinal glands and the nerves presiding over the functions of digestion.

Dysmenorrhœa, with cramps. Faradization with the sedative currents, one electrode in the uterus and one on the abdomen, using a large abdominal pad (electrode). Begin with a small current, and gradually increase it. Seance, 15 minutes, three times a week.

(a) The galvanic current with negative pole in uterus, for 10 minutes, and then the faradic high tension for 10 minutes.

Eczema. Static spray relieves the itching and fifteen to twenty applications cure.

Endometritis. Positive electrode in the uterus, and clay electrode on the abdomen, current (galvanic) of 15 to 60 ma., 10 to 20 minutes, twice a week for two months.

Epilepsy. Positive galvanic electrode to the forehead, negative to nape of the neck; 3 ma. for 5 minutes daily.

(a) **Central galvanization.** Negative electrode over epigastrium, **stabile**. Positive, **labile**, over forehead, top of head, along inner border of sterno-cleido-mastoid, from mastoid fossa to sternum, at nape of neck and down the entire length of the spine, 5 ma., increased in latter part of operation to 10 ma., Seance 30 minutes. (b) Static head breeze for 15 minutes daily.

Epistaxis. Galvanism. Positive electrode (made of copper, in the nasal cavity in contact with erectile or varicose tissue that causes bleeding; negative to sternum; 16 to 20 ma.) Seance 10 minutes.

Fissure in ano. Galvanism, negative applied to the whole surface of the fissure, positive on thigh, 5 to 8 ma., seance 5 minutes once a week.

Fistula. Galvanism. Insert probe pointed copper wire, to full depth of fistula, attached to positive pole; negative at some distant point. 10 ma., 5 minutes. Reverse current to free electrode.

Goitre. Use the galvanic, faradic and sinusoidal current. Fibrous goitres are not curable, but electricity improves the general condition. Soft goitres, not cystic, are absorbed by the action of the sinusoidal current.

Headache-Migraine. Static breeze, and friction.

Herpes zoster. Static spark and spray.

Hemorrhoids. Galvanism. Inject tumor with 1/16th gr. cocaine. Apply clamp attached to the positive pole to the base of the tumor, electrode (negative) with platinum needle in the tumor, 5 to 10 ma., until the tumor is blanched to a whitish color. (a) Galvanism. Positive electrode with platinum needles, in the tumor, negative on the back. 10 ma., seance 5 to 8 minutes. One or more needles may be used in the electrode.

Impotency. Faradization with a very gentle current through the testicles and prostate will frequently effect a cure with cold bathing of the genitals.

Insomnia. Galvanism. Positive to forehead, negative to nape of neck, 2 to 3 ma., seance 10 minutes. Alternate at next sitting with positive to cervical vertebræ, negative to epigastrium, 10 ma., seance 15 minutes. Alternate at next sitting with positive on cervical spine, negative attached to foot bath, 15 ma., seance 15 minutes.

(a) Static breeze to the head for 20 minutes daily, in the evening.

Lumbago. Place small Leyden jar in the circuit, large sponge electrode to the abdomen, positive over the seat of pain, short-circuit the sliding poles, and move plates (machine) rapidly to get sedative action. Seance 15 minutes. (a) Employ a Leyden jar current (negative) with foot bath of a solution of bicarbonate of soda, and hand bath of the same, with positive to the hand; short circuit the sliding poles; turn the plates rapidly; gradually widening the spark-space till a tingle is felt in the feet or arms. Seance 15 to 20 minutes.

This treatment has a marked effect on nutrition, metabolism and elimination. This does not relieve pain like the spark or breeze, but it eliminates uric acid. Currents of high frequency and high tension exert a powerful influence on metabolism and elimination. This has been demonstrated by examinations of the urine of patients while undergoing treatment.

While ordinarily a short seance is advised, so as not to tire the patient, there are some chronic cases where a rather long seance is demanded; and again we must exercise patience, and not despair of effecting a cure even after several months of failure.

Lupus. Galvanism. Apply a thin copper electrode attached to the positive pole to the lesion; and negative to the sternum. 10 to 15 ma. 5 minutes, or until it is thoroughly colored with oxychloride of copper. Moistening with salt water hastens the action.

Locomotor ataxia. Galvanism. Positive electrode 2x24 in. to the spine, negative to the sternum, 5 ma., 10 minutes daily, gradually increasing at each sitting till 20 ma. is reached.

(a) Galvanic bath tub, positive to the head, negative to the

feet, 200 ma. (a patient only receives 1-5 of current); seance 10 to 15 minutes every day for six days, then every other day till 15 baths are taken.

(b) Static direct spark to full extent of spine for 5 minutes and followed by static head breeze for 15 minutes.

Menorrhagia. Galvanism. Positive pole in the uterus, negative on the abdomen, 15 to 50 ma. The effect is increased by using a tin or copper electrode in the uterus.

Neurasthenia. Static breeze, friction and spark to the spine.

Neuritis. Static spark, or static induction current. This will also cure sciatica and help some forms of neuralgia and neuritis.

Paralysis from cold. Treat with the rapidly interrupted Leyden jar current. It is curable.

Pregnancy. The disorders of pregnancy, and the disturbances at the menopause readily yield to static electricity.

Prostrate gland, Hypertrophy. Galvanism. Electrode with an active point, about 1 inch in length, attached to negative pole, and introduced into the prostatic urethra; positive to spine, or in the rectum; 5 ma. for 5 minutes, and repeat in about 5 days.

(a) Galvanic cautery. Newman's galvano-cautery sound is best.

Pruritus. Faradism. Long fine wire secondary coil with rapid interruptions; one electrode in hand, and the other over lesion. Seance 5 to 10 minutes daily.

(a) Galvanism. Positive pole to lesion, negative in the hand; 5 ma. for 10 minutes daily.

Pain, relief, of. Positive pole of galvanic current.

(a) Faradic current from long fine wire secondary coil rapidly interrupted.

(b) Cataphoresis. Galvanism. Use solution of cocaine to positive pole.

Pain, ovarian, and neuralgia. Faradization, sedative current, one pole in the vagina and the other on the abdomen. Seance 15 minutes. A few treatments relieve.

Ovarian pain, whether from neuralgia or due to cystic ovaries, prolapsed ovaries, or salpingitis, is also relieved by the static induction current.

Psoriasis. This disease is not often cured by electricity, but the alternating current of great frequency sometimes cures.

Paralysis, facial. Treat with the static current, and hold the electrode about two inches away from the face to avoid a spark.

Paralysis, traumatic. Where there is an injury to a nerve trunk that does not destroy it, a cure is possible in connecting muscles. If cause is central from an effusion which will absorb, or an injury which time will heal, static electricity will

hasten the cure of the paralysis by building up the general system, promoting local reabsorption and healing.

Rheumatism and gout. Both these diseases have been relieved by cataphoresis, iodide of lithia being transferred to the tissues, but as the static current has been successful in these cases it seems unnecessary.

Rheumatism, muscular. Positive breeze to painful parts. Approach the electrode (brush) near the surface and shower with spray; quickly increase the intensity of the current, and let fine needle sparks flow. If a very obstinate case, slow the machinery and apply positive sparks from the grounded electrode. Seance 8 minutes.

Rheumatism, arthritis with ankylosis. Employ a persistent treatment with static electricity, applying it in various ways.

Sterility, due to non-development of the uterus. Faradism. Coarse wire secondary coil, slow interruptions. Bipolar method—electrode in the uterus. Seance 5 to 8 minutes.

Stricture, lachrymal duct. Galvanism. Attach a small olive-pointed probe (insulated by a coating of shellac varnish to within one-eighth inch of the end) to the negative pole; positive in the hands. Introduce the probe into the duct until the stricture is engaged and gradually turn on the current until 2 to 3 ma. are reached. The point of the probe will pass through the stricture in a few minutes.

Salpingitis, acute. Faradism. Bipolar electrode in the vagina. Long fine wire secondary coil, rapid interruptions. Seance 20 to 25 minutes.

Spermatorrhœa. Galvanism. Sound with long olive point attached to negative pole in prostatic urethra; positive to small of the back. Three ma. for five minutes. Remove urethral electrode, and employ spinal galvanization for five minutes longer. Positive pole to the nape of the neck, negative on lumbar region; 20 to 25 ma. Sittings every other day.

Sciatica. Long percussion sparks (static) aggravate at first. Chronic neuralgias with nerve degeneration, sciatica, facial neuralgia (fifth pair) may not be cured by electricity. The same may be said of locomotor ataxia, myelitis, epilepsy, insanity and diabetes, but in many of these hopeless cases much relief follows treatment.

Skin diseases. Their successful treatment depends on the great principle that acute diseases need soothing remedies, while the sub-acute and chronic, need stimulation. As the static current can be made both a local and general sedative, a tonic, a stimulant, and a counter-irritant, while it promotes nutritive action, it becomes a valuable aid in treating skin diseases.

Superfluous hair, facial blemishes, moles, warts, birthmarks or wrinkles can be removed by electrolysis without disfigure-

ment. In removing superfluous hair the negative galvanic current dissolves and loosens the hair by destroying the follicle. A jeweler's broach (it must be an extremely fine needle) is passed along the hair without force, into the follicle and a current of $1\frac{1}{2}$ to $2\frac{1}{2}$ ma. turned on, and the needle allowed to remain for 20 or 30 seconds. A larger dosage leaves a scar.

The chloride of silver dry portable battery can be used for this operation and for all other purposes for which a portable battery is applicable. Only a few hairs should be extracted at one sitting and the hair must not be extracted by using any force.

Singers, voice of. The Leyden jar current (static) has a wonderful effect in restoring the voice of singers.

Stricture of the urethra. A whip-like electrode is passed into the urethra, and connected with the negative pole of a continuous current galvanic battery, and a current of 10 ma. turned on. Seance 30 seconds. The urethra must be made aseptic before and after the operation. Pass a No. 22 F. or No. 24 F. after the operation, on the third day, and every month for a time. A sound must not be kept in the urethra for any length of time.

(a) Galvanism. Use a Newman's sound about three sizes larger than the calibre of the stricture. Attach it to the negative pole; positive electrode on the back. Engage the stricture with the sound, and turn on the current gradually until 5 ma. is reached. Use little or no pressure, and the bulb will pass the stricture in about five minutes. Before turning off the current draw the bulb back through the stricture. Repeat in five to seven days with an electrode having a larger bulb.

About one out of every five strictures is too hard for electrolysis.

Strictures of the urethra, uterus, rectum and œsophagus have been successfully treated by the galvanic (electrolytic) current.

Subinvolution of the uterus. In these cases there is usually, endometritis, hemorrhage, or menorrhagia, which is cured at the same time that the subinvolution is relieved.

Treatment. Galvanism. Positive pole in the uterus and negative on abdomen, followed by bipolar faradization, 22 wire current. Seance 10 minutes twice a week, gradually lengthening the intervals for three months.

(a) Faradism. Coarse wire secondary coil, 500 to 600 interruptions per minute; bipolar electrode in the uterus 10 minutes daily.

(b) Galvanism. Positive electrode in the uterus, negative on abdomen, 25 ma., 5 to 8 minutes every second day.

Stenosis, uterine. Galvanism. With an olive-pointed electrode of suitable size and shape, attached to the negative pole, introduced into the uterus; positive to the abdomen; turn on a

current of 20 to 25 ma. and the olive-point will pass through the stenosed canal in about 5 minutes,

Repeat every third day, using a larger olive-point at each sitting.

Tuberculosis. The general debility, headaches, pains, constriction of the chest and other symptoms of phthisis are greatly relieved by the static current.

Uterine fibroids. Positive pole in the cervix up to the fundus; tunneling by electrolysis to the fundus where the tumor prevents the introduction of the electrode; and the negative pole on the lower abdomen with a moist clay electrode, with constant galvanic current. This stops the hemorrhage and reduces the size of the tumor, and it gives no trouble but it does not entirely destroy the tumors.

It is not the intention to absolutely destroy tissues around the electrode but to favor absorption of adventitious tissue and the number of cells cannot be fixed, as in dry weather six cells will do as much as ten in a rain-storm or a fog, and the patient is more sensitive one day than another.

Ulcers, Exuberant or Fungus. Galvanism. Apply a suitable electrode made of zinc, attached to the positive pole, to the lesion, negative to the sternum, 20 to 25 ma., seance 5 minutes. Repeat if necessary in about three days. Where not contraindicated use cocaine anæsthesia locally before operating.

In the diagnosis of peri-uterine inflammation with the constant galvanic current it is found that if more than 40 or 50 ma. are not borne a laparotomy is warranted, while if currents of this power are well borne progressive improvement will follow treatment. If pain follows the treatments, with evening fever, these are signs that the case is curable.

One should know how to detect the positive pole of a static machine when this is in doubt. The pole from which the spark jumps is positive; or if you continue to work the machine a violet tint shows the negative pole, and a white light the positive, or if a conductor is applied to the positive pole the spark will be abolished, while it will continue if applied to the negative pole.

The fleuroscope is useful in determining the condition of fractures, dislocations, the presence of foreign bodies or bony growths. It is a valuable aid to diagnosis in old fractures and doubtful dislocations, as of the elbow, bone disease, exostosis, tumors, loss of substance, and in tubercular disease of the lungs,

Cataphoresis. Transferring medicines through the skin by means of the electric current is not new, as this fact, as well as that metals could be expelled from the body by electricity, was known and practiced more than fifty years ago.

As an illustration of cataphoresis: Take a flat electrode two and one-half centimeters in diameter, covered with leather or flannel, and wet it with a five per cent solution of cocaine; attach it to the anode and turn on a current of 6 ma. for five minutes, when it will be found that the skin is anæsthetized. For deep anæsthesia place the cathode directly opposite the anode.

Ordinarily, in practicing cataphoresis a sponge may be saturated with the remedy and applied to the positive pole.

Cataphoresis has been successful in the treatment of enlargement of the thyroid gland, parasitic skin diseases, and some other afflictions.

In treating disease with electricity great knowledge and expertness is required on the part of the operator. It cannot be successfully employed according to a fixed routine. There must be specific diagnosis and a specific treatment.

WEIGHTS AND MEASURES.

Table of Apothecaries' Weights.

One Grain (Granum)	gr. = a grain.
One Scruple (Scrupulus).....	℥ = 20 grains
One Drachm (Drachma).....	ʒ = 60 “
One Ounce Troy (Uncia).....	℥ = 8 drachms.
One Pound (Libra).....	℔ = 12 Troy ounces.

Table of Measures of Capacity or Fluids.

One Minim (Minimum).....	℥ = a minim.
One Drop (Gutta).....	gtt = about ½ minim.
One Fluid Drachm (Fluidrachma).....	ʒ = 60 minims.
One Fluid Ounce (Fluiduncia).....	℥ = 8 fluid drachms.
One Pint (Octarius).....	℔ = 16 fluid ounces.
One Gallon (Congius).....	C = 8 pints.

Metric System.

WEIGHTS.

One Myriagramme.....	Equals 10,000. Grammes.
One Kilogramme.....	“ 1,000. “
One Hectogramme.....	“ 100. “
One Decagramme.....	“ 10. “
One Gramme (the unit of weight)	Equals the weight of one cubic centimeter of water at 4° C.
One Decigramme.....	Equals 0.1 Gramme.
One Centigramme.....	“ 0.01 “
One Milligramme.....	“ 0.001 “

MEASURES OF CAPACITY OR LIQUIDS.

One Myrialiter.....	Equals 10,000. Liters.
One Kiloliter.....	“ 1,000. “
One Hectoliter.....	“ 100. “
One Decaliter.....	“ 10. “
One Liter (the unit of measure)	Equals the volume of one cubic decimeter.
One Deciliter.....	Equals 0.1 Liter.
One Centiliter.....	“ 0.01 “
One Milliliter	“ 0.001 “

Metric System with Equivalents.

METRIC WEIGHTS.

EQUIVALENTS.

One Myriagramme ... Equals	22.046	Pounds	Avoirdupois.
One Kilogramme....	" 15,432.35	Grains	Troy.
One Hectogramme ...	" 1,543.235	"	"
One Decagramme....	" 154.323	"	"
One Gramme	" 15.432	"	"
One Decigramme	" 1.543	"	"
One Centigramme ...	" 0.154	"	"
One Milligramme	" 0.015	"	"

METRIC MEASURES.

EQUIVALENTS.

One Myrialiter ...	Equals 2641.7	Gallons.
One Kiloliter.....	" 264.17	"
One Hectoliter.....	" 26.417	"
One Decaliter	" 2.6417	"
One Liter Equals 2.113	Pints.	" 0.264
One Deciliter.....	" 3.381	fluid Ounces.
One Centiliter	" 2.704	fluid Drachms.
One Milliliter.....	" 16.231	Minims.

Apothecaries' Weights and Measures with Metric Equivalents.

WEIGHTS.

EXACT METRIC EQUIVALENTS.

1 Ounce Avoirdupois (437.5 grs.)	Equals 28.350	Grammes.
1 Ounce Troy (480 grs.).....	" 31.103	"
1 Drachm Troy (60 grs.).....	" 3.888	"
1 Scruple (20 grs.).....	" 1.296	"
1 Grain.....	" 0.06479	"
1-10 Grain.....	" 0.006479	"
1-60 "	" 0.001079	"
1-100	" 0.000648	"
1-200	" 0.000324	"
1-500	" 0.000129	"

MEASURES. EXACT METRIC EQUIVALENTS. APPROXIMATE EQUIVALENTS.

1 Gallon Equals	3.7854	Liters	Equals 4	Liters.
1 Quart	" .94636	"	" 1	"
1 Pint	"	"	" $\frac{1}{2}$	"
8 Fluid. oz.	" 236.590	"	" $\frac{1}{4}$	" or 240 c. c.
4 " " "	" 118.295	"	" $\frac{1}{8}$	" or 120 c. c.
1 " " "	" 29.574	"	"	30 cubic Centimeters.
1 " dra.	" 3.697	"	"	"
1 Minim	" 0.061	"	Centimeter.	

Since one cubic centimeter of water weighs one gramme the word "gramme" is often used instead of cubic centimeter for liquid measure.

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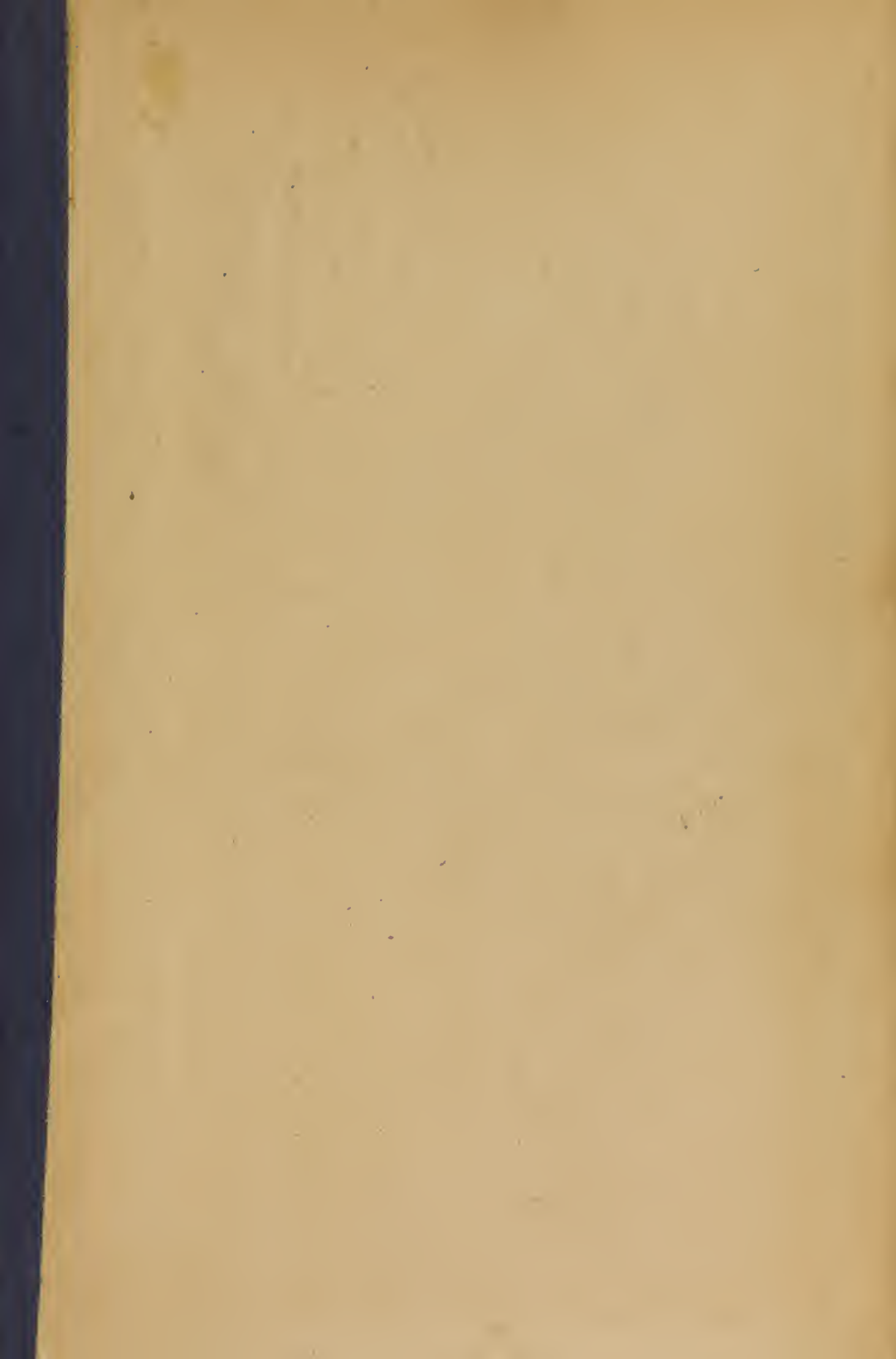
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